

**FOURTH FIVE-YEAR REVIEW REPORT FOR
BURGESS BROTHERS LANDFILL SUPERFUND SITE
BENNINGTON COUNTY, VERMONT**



Prepared by

**U.S. Environmental Protection Agency
Region 1
BOSTON, MASSACHUSETTS**

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Date

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LIST OF ABBREVIATIONS & ACRONYMS

AOC	Administrative Order by Consent
ARAR	Applicable or Relevant and Appropriate Requirement
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
COC	Contaminant(s) of Concern
DCA	Dichloroethane
DCE	Dichloroethene
EPA	United States Environmental Protection Agency
FFS	Focused Feasibility Study
FYR	Five-Year Review
HHRA	Human Health Risk Assessment
HI	Hazard Index
ICL	Interim Cleanup Level
IC	Institutional Control
LTMP	Long-Term Monitoring Plan
MCL	Maximum Contaminant Level
µg/L	Micrograms per Liter
mg/kg	Milligrams per Kilogram
MNA	Monitored Natural Attenuation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ng/L	Nanograms per liter
NPL	National Priorities List
O&M	Operations & Maintenance
OU	Operable Unit
PA/SI	Preliminary Assessment and Site Inspection
PCE	Tetrachloroethylene
PDI	Pre-Design Investigation
PFAS	Per- and polyfluoroalkyl substances
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PL	Performance Level
PRP	Potentially Responsible Party
ppt	Parts Per Trillion
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act of 1976
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RSL	Regional Screening Level
SVE/AS	Soil Vapor Extraction/Air Sparging
SVOC	Semi-Volatile Organic Compound
TCE	Trichloroethylene
VC	Vinyl chloride
VOC	Volatile Organic Compound
VTAEC	Vermont Agency of Environmental Conservation
VTANR	Vermont Agency of Natural Resources
VTDEC	Vermont Department of Environmental Conservation

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this five-year review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Oil and Hazardous Substance Pollution Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fourth FYR for the Burgess Brothers Landfill Superfund Site. The triggering action for this statutory review is the completion date of the previous FYR, September 23, 2015. The FYR has been prepared because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of a single, site-wide, operable unit (OU). The remedial action consists of engineered caps for the former Landfill and Marshy Areas, landfill gas management, a groundwater collection and treatment system, surface water management, and institutional controls.

The Burgess Brothers Landfill Superfund Site Five-Year Review was led by Christopher Kelly, EPA hydrogeologist and Ronald Jennings, EPA Remedial Project Manager (RPM). EPA participants included Ronald Gonzalez, Site attorney; Courtney Carroll, risk assessor; and Darriel Swatts, community involvement coordinator. Vermont Department of Environmental Conservation (VTDEC) participants included Gerold Noyes, the State project manager. Geoffrey Seibel of de maximis, Inc. and Mark White of Environmental Partners Group, Inc., (the “Burgess Brothers Steering Committee”) were notified of the initiation of the five-year review. The review began on November 19, 2019.

Site Background

The Site is located in the southern Vermont towns of Bennington and Woodford, encompassing approximately 12 acres in the northeastern portion of a 100-acre land parcel (see **Figure 1**). The landfill area is enclosed by a perimeter fence and is accessible via an unpaved road connected to Burgess Road to the south. The Green Mountain National Forest borders the Site to the east. Residential dwellings are located several hundred feet northwest of the Site and are connected to the public water supply system.

The Site was operated as a sand and gravel quarry beginning sometime in the 1940s, and by the early 1950s was used as a metal salvage facility and disposal area. Metals, sludge, rejected small appliances, and military specialty batteries were also disposed of at the Site. Site investigations and information provided by the former Site operator indicated that the landfill also received newspaper and building demolition debris. Two lagoon cells (unlined pits) received liquid wastes and sludge from approximately 1967 to 1976. These wastes consisted of lead sludge, lead-contaminated wastewater, spent solvents, and battery wastes. Use of the Site for waste disposal was terminated by the Vermont Agency of Environmental Conservation (VTAEC) in 1976. Volatile organic compounds (VOCs) including tetrachloroethylene (PCE); trichloroethylene (TCE); vinyl chloride (VC); chloroethane; 1,1-dichloroethene (1,1-DCE); 1,2-dichloroethane (1,2-DCA); methylene chloride, and benzene as well as several metals have historically been detected at elevated levels.

Current land use consists of the operation and maintenance of the remedial components within the approximately 12-acre Site. Land use at the Site has not changed since the issuance of the 1998 Record of Decision (ROD) and is not expected to change in the near future. The status of Site ownership is unclear at this time, since the owner of

record, Clyde Burgess, Jr. is deceased, and property taxes have been unpaid since 2016. Site access by EPA, the State of Vermont, and the Burgess Brothers Steering Committee has not been affected.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Burgess Brothers Landfill Superfund Site		
EPA ID: VTD003965415		
Region: 1	State: Vermont	City/County: Bennington and Woodford/Bennington County
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	Has the site achieved construction completion? Yes	
REVIEW STATUS		
Lead Agency: EPA		
Author Name (Federal or State Project Manager): Christopher Kelly/Ron Jennings		
Author Affiliation: EPA		
Review Period: 11/19/2019 - 9/16/2020		
Date of Site Inspection: 6/23/2020		
Type of Review: Statutory		
Review Number: 4		
Triggering Action Date: 9/23/2015		
Due Date (five years after triggering action date): 9/23/2020		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

Pursuant to an Administrative Order by Consent (AOC) effective August 27, 1991, the Settling Potentially Responsible Parties (PRPs) commenced a Remedial Investigation and Feasibility Study (RI/FS) for the Site under EPA oversight. The Settling PRPs completed the RI and FS, and EPA issued a report for each evaluation in February 1997 and March 1998, respectively.

The RI identified elevated levels of VOCs, semi-volatile organic compounds (SVOCs), and metals within the landfill and the former lagoon cells which were considered a “hot spot” of contamination. Elevated concentrations of VOCs, SVOCs, and metals were found within the soils and sediments in the Marshy Area, comprised of several small wetlands located south and southeast downslope of the landfill. Elevated levels of VOCs were found in the overburden groundwater in the Landfill Area, former lagoon cells, Marshy Area, and downgradient of the landfill. A map depicting prominent Site features is included with this review as **Figure 2**.

Unacceptable human health risks associated with the Site were related to the potential future ingestion of shallow groundwater. Both the average (1×10^{-3}) and maximum (7×10^{-2}) cancer risk estimates exceeded the EPA benchmark of 1×10^{-4} (1-in-10,000). The average and maximum Hazard Index (HI) estimates for non-cancer risk (HI = 20 and HI = 300, respectively) exceeded the EPA benchmark of HI = 1. PCE, TCE, VC and 1,1-DCE were considered the main contributors to overall Site risk.

The carcinogenic and non-carcinogenic risk values estimated for the consumption of groundwater from deeper aquifers were below 1×10^{-4} (and HI < 1) and were not determined to warrant a remedial action. Human Health risk from exposure to surface and subsurface soils outside of the landfill boundary, stream sediments, and surface water were below a HI of 1 and were not determined to warrant a remedial action.

The ecological risk assessment concluded that exposure to contaminants in surface soils outside of the original landfill boundary and Marshy Area could impact certain wildlife species foraging in those areas. Elevated levels of organics (PCE and TCE) were identified in leachate seeps, and sediment concentrations of nickel, cadmium, manganese, and lead resulted in actionable risk (mean HI = 7, maximum HI = 22). Concentrations of metals in the surface soils outside the Landfill Area were determined to potentially exhibit an adverse impact on shrews (insectivores; HI = 29) and meadow vole (herbivores; HI = 9). Higher trophic levels (American robin; HI = 130) were found to have greater risks associated with soil contamination at the Site.

Response Actions

In 1976, VTAEC, now the Vermont Department of Environmental Conservation (VTDEC), conducted a site inspection and collected surface water and leachate samples from the landfill. In 1984, VTAEC again sampled surface water and leachate, and private drinking water supplies in the area and completed a Preliminary Assessment and Site Investigation (PA/SI). The PA/SI concluded that organics, solvents, and heavy metals had contaminated soil, surface water, and groundwater at the Site for which the extent of contamination was unknown.

In February 1989, at the request of VTDEC, EPA conducted a site inspection which included surface water sampling. Additional EPA sampling included soil gas surveys, soil sampling in the former lagoon area, surface water sampling, and sediment sampling in the Marshy Area. In March 1989, EPA placed the Site on the National Priorities List (NPL).

In 1989, Eveready Battery Company, Inc. (now a subsidiary of Energizer Holdings, Inc.) installed monitoring wells and sampled groundwater, surface water, soil, and sediment. Early response actions also included the removal of scrap metal from the landfill area and re-grading the landfill and surrounding land to promote surface water drainage.

The 1998 ROD established Remedial Action Objectives (RAOs) for four environmental media at the Site: the landfill, bedrock groundwater, surface water, and ecological receptors. The 2011 ROD Amendment added RAOs for one additional environmental media, overburden groundwater. RAOs for each media are described below:

Landfill

- Prevent, to the extent practicable, the potential for water to contact or infiltrate through the debris mass and lagoon.
- Prevent, to the extent practicable, the generation of landfill seeps and the migration of landfill impacted surface water into the unnamed streams adjacent to the landfill (Marshy Area).
- Control landfill gas emissions so methane gas does not present an explosion hazard; prevent, to the extent practicable, the inhalation of landfill gas containing hazardous substances, pollutants or contaminants and meet state and federal air standards.

- Prevent, to the extent practicable, the migration of contaminated groundwater/leachate beyond the points of compliance by controlling the source of the contamination.
- Minimize the potential for slope failure of the debris mass associated with the landfill cap.
- Prevent, to the extent practicable, direct contact with and ingestion of soil/debris within the landfill and beneath the landfill.
- Control, to the extent practicable, surface water runoff to minimize erosion.
- Prevent, to the extent practicable, the migration of contamination from the lagoon area.
- Prevent, to the extent practicable, the saturation of the landfill debris mass from upgradient groundwater.

Bedrock Groundwater

- Prevent, to the extent practicable, the ingestion of landfill impacted bedrock groundwater exceeding MCLs, Vermont Primary Groundwater Quality Standards, or in their absence, the more stringent of an excess cancer risk of 1×10^{-6} for each compound or a hazard quotient of unity for each noncarcinogenic compound by any individual who may use the bedrock groundwater or within an area that the groundwater could become impacted as a result of pumping activities.
- Restore the bedrock groundwater at the edge of the Waste Management Unit to: MCLs, Vermont Primary Groundwater Quality Standards, or in their absence, the more stringent of an excess cancer risk of 1×10^{-6} for each compound or a hazard quotient of unity for each noncarcinogenic compound.

Surface Water

- Protect off-site surface water by preventing the occurrence of landfill impacted seeps.
- Prevent, to the extent practicable, ecological impacts from contaminants in the Marshy Area.
- Meet federal and state applicable or relevant and appropriate requirements (ARARs) for any surface water discharge.

Ecological

- Protect surface water, to the extent practicable, from exceedances of the Ambient Water Quality Criteria (AWQC) Acute and Chronic Standards.
- Protect sediments, to the extent practicable, from exceedances of the Aquatic Sediment Quality Guidelines of the Ontario Ministry of the Environment.

Overburden Groundwater

- Restore the overburden groundwater at the edge of the Waste Management Unit (capped area of landfill/Marshy area) and beyond to MCLs, Vermont Primary Ground Water Quality Standards, or in their absence, the more stringent of excess cancer risk of 1×10^{-6} for each compound or a hazard quotient of unity for each noncarcinogenic compound.

Status of Implementation

In May 1999, EPA entered into a Consent Decree (CD) with the Settling PRPs (Energizer, Burgess Brothers, Inc. and Clyde Burgess, Jr.) for the Remedial Design and Remedial Action (RD/RA) of the Site remedy. The PRPs had initiated RD prior to the entry of the CD, allowing for completion in June 1999. Construction activities were conducted at the Site between July 6 and October 28, 1999 and are described in the following sections. The Site achieved Construction Completion status on March 29, 2000.

In 2007, with contaminant concentrations increasing downgradient of the capped landfill, the Settling PRPs submitted a draft Focused Feasibility Study (FFS) to evaluate alternative remedial actions to address the

contaminated groundwater. With input from VTDEC, EPA issued a ROD Amendment in September 2011. The original RD/RA Statement of Work (SOW) was amended in September 2012 and the Settling PRPs completed a pre-design investigation (PDI) and RD in June 2013. Construction of the new remedial components (described further below) commenced in August 2013 and achieved Construction Completion status in November 2014. The remedial system has been operational since May 2015.

The following sub-sections describe the implementation of the major components of the remedy selected in the 1998 ROD and 2011 ROD Amendment.

Landfill Area

The Landfill Area was graded and constructed with consideration of the adjacent drainage swales, Unnamed Stream, and wetlands and minimized adverse effects to these areas. Erosion and sedimentation controls were implemented to protect the environmentally-sensitive areas adjacent to the Landfill Area. Landfill grading and capping led to the loss of approximately 0.64 acres of wetlands; as required by the CD, the responsible parties resolved liability for any natural resource damages associated with the loss of wetlands. A continuous multi-layer cap was constructed over the Landfill Area. The cap was designed and constructed, and continues to be operated and maintained to meet the performance requirements of the Resource Conservation and Recovery Act (RCRA) Subtitle C Hazardous Waste Landfill regulations.

Landfill Gas Management

The landfill cap includes a gas collection layer with two gas vents located at the highest elevation of the landfill. Because initial sampling results of landfill gas at the vents found VOC concentrations below Performance Levels set forth in the 1998 ROD by at least four orders of magnitude, landfill gas continues to be passively vented to the atmosphere.

Ambient air and gas vent monitoring was conducted prior to startup of the soil vapor extraction/air sparging (SVE/AS) system (see below) on December 13, 2000.

Marshy Area Cap

The 0.5-acre Marshy Area cap was constructed using a 24-inch thick permeable soil barrier, with the top 6 inches comprised of topsoil. The barrier design was based on constructability, maintenance, and ability to achieve RA objectives. To promote positive drainage from the area, soils were shaped to achieve a minimum 3% grade toward drainage swales that were constructed as part of the multi-layer cap over the Landfill Area.

SVE/AS System

The SVE/AS system was constructed to remediate soils in the former lagoon area considered to be the source of groundwater contamination. The air sparging system was designed to be used in conjunction with the SVE system to remediate the saturated zone soils by forcing air into the groundwater beneath the former lagoons, accelerating the volatilization of VOCs in both the saturated and vadose zones, and forcing them upwards towards the vapor extraction wells. The SVE system removed VOCs from the vadose zone soils by drawing air through extraction wells with granular activated carbon (GAC) treatment. Due to a lack in remedial efficacy (inadequate VOC source control), operation of the SVE/AS system was initially suspended in 2002. The SVE component operated intermittently from 2004 to October 2012, when EPA formally approved the decommissioning of the treatment system.

Groundwater Collection and Treatment System

The RD for the groundwater collection and treatment system was completed in June 2013 and included four major construction components:

- Two groundwater collection trenches were constructed; one at the Landfill Compliance Boundary and the other approximately 175 feet farther downgradient. The design included the installation of extraction wells, force mains, and power and control conduits at both trenches;
- Placement of dewatered excavated soils from the trenches above the existing Landfill Area cap and encapsulated within a new RCRA Subtitle C cover;
- An *ex-situ* treatment system, collocated in the SVE/AS building, that included an equalization tank, particulate filters, a shallow-tray air stripper, and vapor-phase and liquid-phase carbon units, with discharge of treated groundwater to the Unnamed Stream; and
- Lining the toe-of-slope swale between the limit of the existing landfill cap to where the swale discharges into the Unnamed Stream, to prevent surface water runoff from entering the collection trench.

Construction of the remedy began in August 2013 and was completed in November 2014 with the Baseline Groundwater sampling event conducted in October 2014. The system experienced multiple shutdowns due to elevated iron concentrations in influent groundwater. Two above-ground settling tanks were added to the treatment train between the air stripper and liquid-phase carbon units. Operation of the collection trenches and treatment system resumed in May 2015 and is ongoing.

Surface Water Management

Surface water drainage controls were constructed to minimize erosion of the cap and impacts to abutting wetlands. Drainage swales were installed on the top and perimeter of the landfill to control runoff. The Landfill Area was re-vegetated and is maintained to prevent erosion. Storm water runoff from the Landfill Area is managed in accordance with Vermont Water Quality Standards. The drainage system of the cap is designed to withstand a 100-year, 24-hour storm event.

Institutional Controls

Institutional controls restricting access to the Site consist of appropriate signage, fencing, and a secured gate. A Grant of Environmental Protection Easement and Declaration of Restrictive Covenants was placed on approximately 12 acres of the Site that encompasses the landfill, Marshy Area, and downgradient area. In addition to these controls, the State of Vermont reclassified the groundwater beneath the Site from Class III to Class IV, establishing a Groundwater Reclassification Zone to further limit future use of the Site.

The Grant of Environmental Protection Easement and Declaration of Restrictive Covenants serves to ensure the integrity of the Remedial Action as constructed, including the Landfill Area and Marshy Area caps, the SVE/AS, the landfill gas collection system, and the surface water drainage infrastructure. This easement runs with the land and prohibits the use of the Site groundwater for any purpose and the use of the land for residential purposes.

The groundwater beneath and immediately around the landfill has been reclassified by the state from Class III (suitable for human consumption with minimal treatment) to Class IV (non-potable). This was accomplished through a petition submitted by the VTDEC, at the request of the PRPs, to the Secretary of the Vermont Agency of Natural Resources (VTANR). This request was approved on November 6, 2003. The Reclassification prohibits the Site groundwater from use as a domestic water supply. This reclassification is to serve as an interim control to remain in effect while remedial actions continue and shall remain in effect until the cleanup is complete and performance levels are attained.

A detailed Site Chronology is included with this review as **Appendix B**; a Site Map depicting relevant Site features is included as **Figure 2**.

IC Summary Table

Table 1: Summary of Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	All groundwater(s) underlying 12.43 acres of the Land Parcel Recorded on Book 138, Page 23 of the Bennington Land Records.	Prohibits the Site groundwater from use as a domestic water supply.	Findings of Fact and Reclassification Order Burgess Brothers Superfund Site, Bennington, Vermont, November 2003
Groundwater, Soil, Surface Water, Sediments, Landfill Gas	Yes	Yes	Approximately 11.73 acres contained within the Land Parcel Recorded on Book 138, Page 23 of the Bennington Land Records and Book 21, Page 121-122 of the Woodford Land Records and the Land Parcel Recorded on Book 21, Page 238 of the Woodford Land Records.	Ensures the integrity of the Remedial Action as constructed, including the Landfill and Marshy Area cap, the groundwater treatment system, the landfill gas collection system and the surface water drainage infrastructure; prohibits the use of the Site groundwater for any purpose and the use of the land for residential purposes.	Grant of Environmental Protection Easement and Declaration of Restrictive Covenants, January 2005

Systems Operations/Operation & Maintenance

The 2012 Amended SOW required the Settling PRPs to submit a detailed operations and maintenance (O&M) plan as part of the Long-Term Monitoring Plan (LTMP) for the Site. The operation, maintenance, and environmental monitoring activities for the Site are being implemented by the PRPs in accordance with the LTMP and O&M Plan approved by EPA in January 2015. The primary activities associated with the O&M plan include:

- Visual inspection of the Landfill Area and Marshy Area caps with regard to access restrictions, vegetative cover, settlement, stability, and any need for corrective action. In addition, the caps are mowed semi-annually;

- Inspection of the drainage swales for blockage, erosion and instability, and any need for corrective actions;
- Inspection of the condition of groundwater monitoring wells;
- Monitoring and sampling of groundwater wells, surface water, and sediment; and
- Operation and maintenance of the groundwater treatment system, including carbon change-outs, solids removal, and responding to intermittent power outages.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last five-year review as well as the recommendations from the last five-year review and the current status of those recommendations.

Table 2: Protectiveness Determinations/Statements from the 2015 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1	Short-term Protective	The remedy at the Burgess Brothers Superfund Site currently protects human health and the environment because exposure pathways for direct contact and groundwater ingestion have been controlled by the Landfill and Marshy Area cap and institutional controls, respectively. However, in order for the remedy to be protective in the long-term, the following action needs to be taken to ensure long-term protectiveness: the groundwater collection trenches have to operate successfully to capture and treat contaminated groundwater to prevent further migration of the contaminant plume from the landfill and to capture the portion of the plume that has already migrated from the landfill.

Table 3: Status of Recommendations from the 2015 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1	Inconsistent operation of groundwater extraction system.	Operate groundwater extraction and treatment system to assess remedy performance.	Completed	O&M reports submitted to EPA and VTDEC since the issuance of the 2015 FYR have indicated that the groundwater treatment system typically has a performance uptime of ~97%; a significant improvement over the issues encountered following initial construction.	2/26/2016

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

A public notice was made available by a region-wide press release announcing the upcoming five-year review for Burgess Brothers Landfill, the only Vermont NPL Site being statutorily reviewed by EPA during the 2020 fiscal year (see **Appendix C**). This notice was sent to all regional newspapers, including the Bennington Banner on 3/13/2020. The results of the review and the report will be made available on the U.S. EPA Site Profile Page for the Burgess Brothers Landfill (<http://www.epa.gov/superfund/burgess>) and in the EPA Region 1 Records Center located at:

Superfund Records Center
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Interviews

During the FYR process, interviews were conducted with parties impacted by the Site, and regulatory agencies involved in Site activities or aware of the Site (e.g., the Town of Bennington). The purpose of the interviews was to document any perceived problems or successes with the remedy that has been implemented to date. The interviews were conducted via e-mail and telephone calls and are summarized below. Completed interview forms are included in **Appendix D**.

The Burgess Brothers Steering Committee

Geoffrey Seibel, the Project Coordinator for the Settling PRP group collected responses that focused on the technical progress of the Site. The responses provided by Mr. Seibel are generally consistent with the findings presented by EPA in this FYR; no additional comments, suggestions, or recommendations were provided.

VTDEC

Gerold Noyes, P.E. has been the State Project Manager for the Burgess Brothers Landfill Site since 1999. Responses to the FYR interview provided by Mr. Noyes generally focused on the consistent transmittal of technical documents and progress reports from the Settling PRPs. An updated e-mail address for Mr. Noyes was added to the Site distribution list.

Town Manager – Town of Bennington, VT

Stuart Hurd is the Town Manager for Bennington, Vermont and has had previous involvement with the Burgess Brothers Landfill Site. Mr. Hurd indicated that communications from EPA regarding Site progress have been minimal. EPA will provide the Town of Bennington with the final Five-Year Review Report for the Burgess Brothers Landfill Site along with contact information for the listed Remedial Project Manager.

Town Clerk – Town of Woodford, VT

Susan Wright is the Town Clerk for Woodford, Vermont. FYR interview questions were transmitted to the Woodford Select Board through Ms. Wright, with responses indicating that the Town of Woodford generally did not receive updates on the status of the Site and requested to be informed on future developments at the Site, including the completion of FYRs. EPA will provide the Town of Woodford with the final Five-Year Review Report for the Burgess Brothers Landfill Site along with contact information for the listed Remedial Project Manager.

Homeowners Abutting the Site

Interview requests were mailed to three residences in close proximity to the Site; one property on Garbrooke Drive and two properties on Burgess Road. At the time of the drafting of this report, EPA received one response from Mr. Glen Sauer of 1236 Burgess Road in Bennington.

Mr. Sauer is the grandson of Clyde Burgess, Jr., the former owner-operator (42 U.S. Code § 9607(a)) of the Burgess Brothers Landfill. Mr. Sauer indicated that the Site receives little, if no attention from homeowners in the surrounding area and that the O&M contractors for the Settling PRPs have been easy to work with. Mr. Sauer expressed concern about the extended remedial timeframe, and the effort required to remediate the groundwater impacts at the Site.

Data Review

Groundwater

EPA oversight of groundwater monitoring at the Site first began in 1994 during the completion of the RI. Following the construction and start-up of the SVE/AS remedy, groundwater and surface water at the Site was routinely sampled according to the April 2000 Demonstration of Compliance Plan. Groundwater sampling for VOCs, SVOCs, and metals occurred on a semi-annual basis through the fall of 2010, targeting a list of 17 contaminants of concern (COCs) identified in the 1997 Baseline Risk Assessment and 1998 ROD for which Interim Cleanup Levels (ICLs) were assigned. Results of the groundwater sampling conducted between 2000 and 2010 indicated that the primary contaminants migrating from the landfill were chlorinated VOCs and manganese. Following EPA approval of the FFS in 2011, groundwater sampling efforts were modified to support the PDI for the proposed groundwater extraction and treatment system. The FFS and PDI recommended dividing the Site into three remedial areas:

- **Area A**, located upgradient of the Landfill Compliance Boundary and includes the Landfill Area, former Lagoon Area and the capped portion of the former Marshy Area;
- **Area B**, located immediately downgradient of the Landfill Compliance Boundary, extending southward approximately 200 feet to the Downgradient Boundary Trench; and
- **Area C**, downgradient of the Downgradient Boundary Trench, extending to where the VOC plume reaches ICLs.

Select monitoring locations were sampled in 2012 as part of the PDI, however, the Baseline groundwater sampling event for Areas A through C occurred in October 2014. The LTMP submitted by the Settling PRPs was approved by EPA in January 2015 and included plans for a Year Two and Year Five sampling event, which occurred in 2017 and 2019, respectively. Consistent with the 2012 Amended SOW, the LTMP includes both performance and compliance monitoring components. Compliance monitoring is intended to demonstrate achievement of cleanup standards at designated compliance points within the groundwater collection trenches and the attainment of groundwater ICLs in Area C through monitored natural attenuation (MNA). Performance monitoring is intended to verify proper operation and effective contaminant treatment within and between the groundwater collection trenches. If no major issues with remedy performance were identified following the completion of the Year Five sampling event, the Settling PRPs could recommend that monitoring events be conducted once every five years, in the calendar year preceding the next FYR. Additionally, the LTMP contained provisions allowing for the discontinuation of sampling for certain inorganics (arsenic, thallium, and lead) that have historically been below the ROD ICLs until the Demonstration of Compliance sampling event is performed.

Analytical results from monitoring wells sampled in 2017 and 2019 indicate that PCE; TCE; cis-1,2-DCE; trans-1,2-DCE; VC; 1,1-DCE; 1,2-DCE; and manganese remain in Area B groundwater above ICLs while PCE; TCE; cis-1,2-DCE; VC; 1,2-DCE; and manganese were detected above ICLs in Area C groundwater. PCE, TCE, VC,

and manganese are considered the main contaminants of concern in Site groundwater; the ranges of detected results from the fall 2019 Year Five sampling event are as follows:

- PCE: 0.18 µg/L (W-35T) to 1,200 µg/L (W-33T), maximum detection in Area C – 49 µg/L (P-01)
- TCE: 0.11 µg/L (W-35S1) to 1,100 µg/L (W-33T), maximum detection in Area C – 62 µg/L (P-01)
- VC: 0.3 J µg/L (PZ-14S) to 460 µg/L (W-33T), maximum detection in Area C – 18 µg/L (P-01)
- Manganese: 6 µg/L (P-21) to 9,780 µg/L (PZ-7S), maximum detection in Area C – 5,330 µg/L (PZ-9S)

Groundwater monitoring data for VOCs and inorganics are presented in **Table 4** and **Table 5**, respectively. Plume maps for PCE, TCE, and VC are presented in **Figures 3, 4, and 5**.

Trends in analytical results from the Baseline, Year Two, and Year Five sampling events are presented in **Table 6**. PCE, TCE and VC concentrations are used as benchmarks in assessing the remedial performance of the groundwater extraction and treatment system, both for the direct removal of chlorinated VOCs and reductive dechlorination through natural processes. Overall, trends for PCE, TCE, and VC from monitoring wells and piezometers located within Areas B and C are either decreasing or stable, indicating that the remedy is functioning as designed. Elevated levels of manganese in Area B and C groundwater are likely attributed to the reducing conditions created by the capped Landfill and Marshy Areas. Certain manganese detections in Area C monitoring wells exceed the ROD ICL of 300 µg/L, however, these exceedances are believed to be contained entirely within the Groundwater Reclassification Boundary. Analytical results for arsenic, thallium, and lead have been below the ROD ICLs for all three of the LTMP sampling events. A low-permeability, clay-rich ablation till geologic unit underlies the sand and gravel overburden, effectively preventing the downward migration of Site contaminants to the bedrock aquifer. Overburden groundwater flows to the south-southwest, discharging to the Unnamed Stream and is the likely source for the chlorinated VOC compounds and metals historically detected in Site surface water and sediments.

While 1,4-dioxane is not a site COC, sampling for the compound was initially included as a recommendation in the 2010 FYR with a milestone completion date of January 1, 2011. Implementation of the FFS, PDI, remedial construction, and the LTMP delayed the initial sampling for 1,4-dioxane in Site groundwater. Samples for 1,4-dioxane were collected in 2017, however, the results could not be used due to high reporting limits. As part of the fall 2019 Year Five sampling event, groundwater samples from EPA-selected monitoring wells W-33S1, W-33T (Area B), and P-02 (Area C) were analyzed for 1,4-dioxane via EPA Method 522. Sample results from W-33S1 and P-02 were below the method detection limit of 0.2 µg/L; monitoring well W-33T yielded a result of 1.9 µg/L, exceeding the Vermont groundwater enforcement standard of 0.3 µg/L and the EPA regional screening level (RSL) for tap water of 0.46 µg/L. Detections of 1,4-dioxane in Site groundwater do not impact the current protectiveness of the remedy because the institutional controls (activity and use restriction easement and State groundwater reclassification) serve to prohibit exposure to Site-impacted groundwater.

In response to per- and polyfluoroalkyl substances (PFAS) concerns in the overall vicinity of the Site, groundwater and surface water samples were collected in 2016. PFAS were detected in four monitoring wells (W-30T, P-01, P-02, and P-08). Groundwater concentrations in two of the sampled monitoring wells (P-01 [64 ng/L] and P-02 [45 ng/L]) exceeded the EPA site-specific groundwater screening level of 40 ng/L for PFOA and the Vermont Groundwater Enforcement Standard of 20 ng/L for the sum of five PFAS compounds (PFOA, PFOS, PFNA, PFHpA, and PFHxS). PFAS sampling results are presented in **Table 7**. To date, PFAS contaminants have not been identified as COCs for the Site. PFAS was also sampled in groundwater treatment system influent and effluent waters; PFOA and PFHpA were detected in two influent samples (SP-101 [58.7 ng/L] and SP-102 [52.4 ng/L]), results for the effluent were non-detect for PFAS compounds. Detections of PFAS in Site groundwater do not impact the current protectiveness of the remedy because the institutional controls serve to prohibit exposure to Site-impacted groundwater and locations where PFOA was detected above the EPA site-specific groundwater screening level are contained entirely within remedial Area C.

Surface Water

Surface water sampling from the Unnamed Stream located along the southern portion of the Site has been conducted since at least the 1970s. Currently available analytical data dates back to September 1992 for SW-P23, the surface water sampling location farthest downgradient of the landfill and associated groundwater plume. The 2015 LTMP calls for surface water monitoring to be conducted at four locations (SW-P19, SW-P21, SW-P23, and SW-CS [Clyde's Swale]) during the Baseline, Year Two, and Year Five monitoring events. SW-CS is considered a background sample, located upgradient of the known impacts to surface water. The 1998 ROD included surface water Performance Levels (PLs) for 20 VOCs and metals identified in the 1997 Baseline Risk Assessment.

Results from the Baseline, Year Two, and Year Five sampling events show that VOCs in surface water are below the ROD PLs, indicating that the current remedy is effectively capturing the groundwater VOC plume before discharge to the Unnamed Stream. Data from the fall 2019 sampling event indicate that iron and aluminum remain above PLs at sampling locations SW-P19, SW-P21, and SW-P23. Aluminum detections in Site surface water are likely naturally occurring, as the analytical results are similar to Site background concentrations. Elevated levels of iron in surface water samples are likely attributed to the reducing conditions created by the capped Landfill and Marshy Areas; these exceedances are believed to be contained entirely within the Site boundary.

Surface water monitoring data for VOCs and inorganics is presented in **Table 8**.

As part of the fall 2019 Year Five sampling event, a surface water sample from monitoring location SW-P21 was analyzed for 1,4-dioxane at the direction of EPA. The sample yielded a 1,4-dioxane result of 0.41 µg/L; neither EPA nor the State of Vermont have established Water Quality Criteria for 1,4-dioxane. In the absence of promulgated surface water quality standards, EPA has concluded that ecological receptors are not likely to be adversely affected by the levels of 1,4-dioxane observed in Site surface water. Additionally, 1,4-dioxane concentrations in Site surface water are not considered a risk to human health, as the 1997 Baseline Risk Assessment did not identify demonstrable risks to human health from contact with Site COCs in surface water.

Site surface water was sampled for PFAS in March 2016. EPA has calculated a site-specific surface water screening level for PFOA of 2,030 ng/L. There were no detections of PFOA above the surface water screening level (maximum result of 4.8 ng/L).

Sediment

Sediment sampling at the Site has been conducted since at least the early 1990s, during the completion of the RI. The 2015 LTMP calls for sediment sampling to be conducted at two locations (SED-14 and SED-CS [Clyde's Swale]) during the Year Five monitoring event. SED-14 is located immediately downgradient of the landfill, and SED-CS is considered a background sample, located upgradient of the known impacts to ground and surface waters. The 1998 ROD included sediment PLs for 10 metals identified in the 1997 Baseline Risk Assessment.

Results from the Year Five sampling events indicate that manganese remains above PLs at sampling location SED-14. Elevated levels of manganese in Site sediment are likely attributed to the reducing conditions created by the capped Landfill and Marshy Areas; these exceedances are believed to be contained entirely within the Site boundary. Sediment monitoring data for inorganics is presented in **Table 9**.

Site Inspection

EPA conducted a Site inspection on June 23, 2020. Chris Kelly, representing EPA, met with representatives from Environmental Partners, Inc., consultants to the Settling PRPs. VTDEC was represented by Gerold Noyes, State project manager for the Site. The purpose of the inspection was to assess the protectiveness of the remedy. Generally, the Burgess Brothers Landfill Site is maintained in very good condition; fences and the treatment

building are locked, signage identifying the Site is clearly affixed to the treatment building, and the landfill cover is mowed twice per year. Monitoring wells, piezometers, and the groundwater collection trenches are properly identified and secured.

Small rooted vegetation was identified in the landfill drainage swales which has routinely been removed by the O&M contractor on an as-needed basis. The presence of a beaver dam on the southeast portion of the landfill area was identified during the inspection; the O&M contractor will first focus on removing dead trees that may damage the adjacent security fence. Additional debris will likely be removed once wildlife vacates the area. The gravel road leading to and from the Site is currently passible with a sedan, however spring snowmelt poses a challenge for access due to muddy conditions along the road. The O&M contractor plans to add more sand and gravel to visible low spots in the access road. A drive-by survey of properties surrounding the Site did not indicate that land use in the immediate area has changed since the last FYR. See **Appendix D** for the Site inspection summary and the associated photodocumentation log.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Yes. There are currently five environmental media with established RAOs at the Site, four specified in the 1998 ROD and one specified in the 2011 ROD Amendment. The RAOs for the landfill were achieved once the RCRA Subtitle C cap was placed on the Landfill and Marshy Areas. The threats posed to human health and the environment through exposure to overburden groundwater, bedrock groundwater, surface water, and sediments are being addressed by active remedial action and institutional controls. The use of the Site has not changed since the 1998 ROD and there are no indicators of issues with the current remedy. Satisfactory operation and maintenance of the groundwater extraction and treatment system is ongoing.

Remedial Action Performance

The RAOs for addressing threats to human health and the environment for the former landfill were achieved following the capping activities of the Landfill and Marshy Areas in 1999. RAOs for bedrock groundwater, surface water, and ecological impacts to surface water and sediment were included in the 1998 ROD; the 2011 ROD Amendment included additional RAOs for overburden groundwater. The groundwater extraction and treatment system currently operating at the Site is actively addressing the chlorinated VOC and metals contamination in overburden groundwater. A low-permeability, clay-rich ablation till geologic unit underlies the sand and gravel overburden, effectively preventing the downward migration of Site contaminants to the bedrock aquifer. Overburden groundwater flows to the south-southwest, discharging to the Unnamed Stream and is the likely source for the chlorinated VOC compounds and metals historically detected in Site surface water and sediments.

Sampling results from the Baseline, Year Two, and Year Five monitoring events indicate that Site contaminants identified in the 1998 ROD are either stable or decreasing in groundwater, surface water, and sediment downgradient of the landfill source area. Following the monitoring event scheduled in 2024, a statistically defensible trend analysis will be performed on the data generated by the LTMP. Trends in analytical data, combined with the institutional controls currently implemented at the Site provide protectiveness of human health and the environment as the remaining RAOs are expected to be met in the future.

System Operations and Maintenance

The January 2015 O&M Plan describes the construction, operations, maintenance, and intended remedial effectiveness of the current groundwater extraction and treatment system. The groundwater treatment system, as described in Section II of this FYR, is operated continuously and is maintained on a consistent schedule. Maintenance activities and inspections of the treatment system are conducted monthly within the treatment

building located on the northwest portion of the Site. Sampling of influent and effluent waters, air stripper discharge, and downloads of groundwater transducer data occur on a quarterly basis with annual reports issued to EPA by March 31 of the following calendar year.

As discussed in the 2015 FYR and Section III of this FYR, inconsistent operation of the groundwater collection and treatment system was considered an issue that could potentially affect the future protectiveness of the remedy. Significant iron fouling throughout the treatment train as initially constructed resulted in frequent shutdowns and unscheduled maintenance activities. The installation of two settling tanks for influent water was completed in 2015 and appears to have adequately addressed the issues related to iron fouling. Currently, the treatment system operates with an uptime of approximately 97%, extracting groundwater at a rate of 3.6 to 4.9 gallons per minute (gpm) while accomplishing the performance objective of depressing the water table elevation at each collection trench.

Implementation of Institutional Controls and Other Measures

The State of Vermont reclassified the groundwater beneath the Site from Class III to Class IV in November 2003, prohibiting the Site groundwater from use as a domestic water supply. The groundwater reclassification serves as an interim control to remain in effect while remedial action is occurring and shall remain in effect until the cleanup is complete and performance levels are attained.

A Grant of Environmental Protection Easement and Declaration of Restrictive Covenants was placed on the Site property for the approximately 12 acres encompassing the landfill, Marshy Area, and downgradient area in January 2005 to ensure the integrity of the Remedial Action as constructed, including the Landfill and Marshy Area caps, the groundwater treatment system, the landfill gas collection system and the surface water drainage infrastructure. This easement also prohibits the use of the Site groundwater for any purpose and the use of the land for residential purposes.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

No. The RAOs specified in the ROD, as amended, are still valid; however, there have been changes in exposure assumptions, toxicity values, and risk methodologies since the time of remedy selection. The changes as described below do not impact the protectiveness of the remedy because a multi-barrier cap remains intact preventing direct contact with Site contaminants, and ICs are in place which prevent the use of groundwater at the Site.

Changes in Standards and TBCs

New standards should be considered during the five-year review process as part of the protectiveness determination. Under the NCP, if a new requirement is promulgated after the ROD is signed, and the requirement is determined to be an ARAR, the new requirement must be attained only if necessary to ensure that the remedy is protective of human health and the environment.

EPA guidance states:

“Subsequent to the initiation of the remedial action new standards based on new scientific information or awareness may be developed and these standards may differ from the cleanup standards on which the remedy was based. These new...[standards] should be considered as part of the review conducted at least every five years under CERCLA §121(c) for sites where hazardous substances remain on-site. The review requires EPA to assure that human health and the environment are being protected by the remedial action. Therefore, the remedy should be examined in light of any new standards that would be applicable or relevant and appropriate to the circumstances at the site or pertinent new [standards], in order to ensure that the remedy is still protective. In certain situations, new standards or the information on which they are based may indicate that

the site presents a significant threat to health or environment. If such information comes to light at times other than at the five-year reviews, the necessity of acting to modify the remedy should be considered at such times.” (See CERCLA Compliance with Other Laws Manual: Interim Final (Part 1) EPA/540/G-89/006 August 1988, p. 1-56.)

PFAS

In May 2016, EPA issued final lifetime drinking water health advisories (HA) for PFOA and PFOS. The EPA HA for PFOA and PFOS is 70 ng/L (ppt) individually or combined. See also EPA’s *Interim Recommendations to Address Groundwater Contaminated with Perfluorooctanoic Acid and Pefluorooctanesulfonate* [OSWER DIRECTIVE 9283.1-47, Dec. 19, 2019]

On July 6, 2019, the Vermont Agency of Natural Resources (VTANR) adopted an amended *Groundwater Protection Rule and Strategy*.¹ The amendment, among other things, updated the list of groundwater enforcement standards. In particular, the amendment finalized a groundwater enforcement standard of 20 ng/L (ppt) for any combination of PFOA, PFOS, PFNA, PFHpA, and PFHxS (see *Groundwater Protection Rule and Strategy*, Appendix One²). On March 17, 2020, a revised Vermont *Water Supply Rule*³ was adopted to establish an MCL for five PFAS compounds. The Rule established an MCL of 20 ng/L (ppt) for the sum of PFAS compounds PFOA, PFOS, PFNA, PFHpA, and PFHxS, individually or combined (see *Water Supply Rule*, Subchapter 6.12, Table 6-1).

To date, PFAS contaminants have not been identified as COCs for the Site. In response to PFAS concerns in the overall vicinity of the Site, as described above, groundwater and surface water samples were collected from select on-site sampling locations. Groundwater concentrations in two of the sampled monitoring wells exceeded the EPA site-specific groundwater screening level of 40 ng/L for PFOA. These PFOA detections are located in the area where groundwater is currently classified as non-potable. Site surface water was sampled for PFAS in March 2016. EPA has calculated a site-specific surface water screening level for PFOA of 2,030 ng/L. There were no detections of PFOA above the surface water screening level. PFAS was also sampled in groundwater treatment system influent and effluent waters; PFOA and PFHpA were detected in two influent samples (SP-101 [58.7 ng/L] and SP-102 [52.4 ng/L]), results for the effluent were non-detect for PFAS compounds. At the time of the drafting of this Five-Year Review, the State of Vermont does not have promulgated surface Water Quality Standards for PFAS; however, Vermont Act 21 (S. 49) of 2019 requires the VTANR to adopt surface Water Quality Standards for PFAS by January 1, 2024.

Groundwater detections of PFOA at two monitoring wells above the EPA site-specific screening level do not impact the current protectiveness of the remedy because there are no current users of groundwater at the Site, the institutional controls serve to prohibit exposure to Site-impacted groundwater, and locations where PFOA was detected above the EPA site-specific groundwater screening level are entirely within remedial Area C. Monitoring for PFAS should continue to ensure the contamination is not migrating beyond the Groundwater Reclassification Boundary. EPA and the VTDEC will evaluate the monitoring results of PFAS compounds to determine if they are Site-related.

1,4-Dioxane

Included in the VTANR amended Groundwater Protection Rule of 2019, is a groundwater enforcement standard of 0.3 µg/L (ppb) for 1,4-dioxane.

¹ VTANR, Chapter 12 of the Environmental Protection Rules: Groundwater Protection Rule and Strategy. Adopted July 6, 2019.

² The groundwater enforcement standard of 20 ppt for any combination of the five PFAS was previously adopted and continued in two emergency rules dated July 11, 2018, and January 8, 2019.

³ VTANR, Chapter 21 of the Environmental Protection Rules: Water Supply Rule. Revised March 17, 2020.

Using 2013 updated IRIS toxicity information and the standard Superfund risk assessment approach, the EPA carcinogenic risk range of 1×10^{-6} to 1×10^{-4} for 1,4-dioxane equates to a concentration range of 0.46 to 46 µg/L (ppb).

Currently 1,4-dioxane is not a Site COC. Detection of 1-4 dioxane in groundwater during the fall 2019 Year Five sampling event yielded a result of 1.9 µg/L, exceeding the Vermont groundwater enforcement standard of 0.3 µg/L and the EPA regional screening level (RSL) for tap water of 0.46 µg/L. However, detections of 1,4-dioxane in Site groundwater do not impact the current protectiveness of the remedy because the institutional controls (activity and use restriction easement and State Groundwater Reclassification) serve to prohibit exposure to Site-impacted groundwater. Monitoring for 1,4-dioxane should continue to ensure the contaminant is not migrating beyond the Groundwater Reclassification Boundary. EPA and the VTDEC will evaluate the monitoring results of 1,4-dioxane to determine if they are Site-related.

During the fall 2019 Year Five sampling event, a surface water sample from monitoring location SW-P21 was analyzed for 1,4-dioxane at the direction of EPA. The sample yielded a 1,4-dioxane result of 0.41 µg/L; neither EPA nor the State of Vermont have established Water Quality Criteria for 1,4-dioxane. In the absence of promulgated surface water quality standards, EPA has concluded that ecological receptors are not likely to be adversely affected by the levels of 1,4-dioxane observed in Site surface water.

Additionally, the amended Groundwater Protection Rule and Strategy finalized a groundwater enforcement standard of 300 µg/L for manganese (which is consistent with the risk-based cleanup standard selected in the ROD).

Changes in Toxicity and Other Contaminant Characteristics

Since the 2015 FYR, there have not been any toxicity changes for Site COCs. Although PFAS and 1,4-dioxane were not evaluated in the HHRA or identified as COCs for the Site, they are included in the discussions below because PFAS and 1,4-dioxane are emerging issues at many NPL sites, including landfills. These changes would not alter the protectiveness of the remedy because the landfill cap remains intact, and ICs are in place to prevent exposure to Site contaminants.

- ***2010 and 2013 1,4-dioxane cancer and non-cancer toxicity values***

In 2010 and 2013, EPA finalized the toxicity assessment for 1,4-dioxane. The new values indicate that 1,4-dioxane is more toxic from both cancer and non-cancer health effects. These toxicity changes would result in increased non-cancer hazard and cancer risk from exposure to 1,4-dioxane.

- ***Lead in Soil***

Updated scientific information indicates that adverse health effects are associated with blood lead levels (BLLs) at less than 10 µg/dL. Several studies have observed “clear evidence of cognitive function decrements in young children with mean or group BLLs between 2 and 8 µg/dL.” Soil screening, action or cleanup level developed based on the previous target BLL of 10 µg/dL may not be protective.

EPA’s approach to evaluate potential lead risks is to limit exposure to residential and commercial soil lead levels such that a typical (or hypothetical) child or group of similarly exposed children would have an estimated risk of no more than 5% of the population exceeding a 5 µg/dL blood lead level (BLL). This is based on evidence indicating cognitive impacts at BLLs below 10 µg/dL. Additionally, this approach aligns with the Lead Technical Review Workgroup’s current support for using a BLL of 5 µg/dL as the level of concern in the Integrated Exposure Uptake Biokinetic Model (IEUBK) and Adult Lead Methodology (ALM). A target BLL of 5 µg/dL reflects current scientific literature on lead toxicology and epidemiology that provides evidence that the adverse health effects of lead exposure do not have a threshold.

EPA's 2017 OLEM memorandum "Transmittal of Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters" (OLEM Directive 9285.6-56) provides updates on the default baseline blood lead concentration and default geometric standard deviation input parameters for the Adult Lead Methodology. These updates are based on the analysis of the NHANES 2009-2014 data, with recommended updated values for baseline blood lead concentration being 0.6 µg/dL and geometric standard deviation being 1.8.

Using updated default IEUBK and ALM parameters at a target BLL of 5 µg/dL, site-specific lead soil screening levels (SLs) of 200 ppm and 1,000 ppm are developed for residential and commercial/industrial exposures, respectively.

Lead in soil was evaluated as part of the 1997 human health risk assessment (HHRA). Though the maximum concentration in surface soil (1,040 mg/kg) was found to be above the residential and commercial screening levels, these soils were consolidated under the multi-layer cap, which remains in place and prevents exposure to Site-impacted soil. Therefore, this updated policy for lead in soils does not call into question the protectiveness of the remedy.

- ***2016 PFOA/PFOS non-cancer toxicity values***

On May 19, 2016, EPA issued final lifetime drinking water health advisories for PFOA and PFOS, which identified chronic oral reference dose (RfD) values of 2E-05 mg/kg-day. These RfD values should be used when evaluating potential risks from ingestion of contaminated groundwater at Superfund sites where PFOA and PFOS are present, based on Site history. Potential estimated health risks from PFOA and PFOS likely associated with a site would increase total site risks due to groundwater exposure. Further evaluation of potential risks from exposure to PFOA and PFOS in other media at the Site might be needed should Site conditions change and may also affect total site risk.

- ***2014 Perfluorobutanesulfonic Acid (PFBS) non-cancer toxicity value***

PFBS has a chronic oral RfD of 2E-02 mg/kg-day based on an EPA Provisional Peer Reviewed Toxicity Value (PPRTV) (USEPA, 2014a). This RfD value should be used when evaluating potential risks from ingestion of contaminated groundwater at Superfund sites where PFBS might be present based on-site history. Potential estimated health risks from PFBS, if identified, would likely increase total site risks due to groundwater exposure. Further evaluation of potential risks from exposure to PFBS in other media at the Site might be needed based on Site conditions and can also affect total site risks.

As stated above, Groundwater detections of PFOA at two monitoring wells above the EPA site-specific screening level do not impact the current protectiveness of the remedy because there are no current users of groundwater at the Site, the institutional controls serve to prohibit exposure to Site-impacted groundwater, and locations where PFOA was detected above the EPA site-specific groundwater screening level are entirely within remedial Area C. Monitoring for PFAS will continue to ensure the contamination is not migrating beyond the Groundwater Reclassification Boundary. EPA will evaluate the monitoring results of PFAS compounds to determine if they are Site-related.

Changes in Risk Assessment Methods

Since the 2015 FYR the following changes have occurred in recommended risk assessment methods:

- ***2014 OSWER Directive Determining Groundwater Exposure Point Concentrations, Supplemental Guidance***

In 2014, EPA finalized a Directive to determine groundwater exposure point concentrations (EPCs): <https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=236917>. This Directive provides recommendations to develop groundwater EPCs. The recommendations to calculate the 95% UCL of the arithmetic mean concentration for each contaminant from wells within the core/center of the plume, using the statistical software ProUCL, could result in lower groundwater EPCs than the maximum concentrations routinely used for EPCs as past practice in risk assessment, leading to changes in groundwater risk screening and evaluation. In general, this approach could result in slightly lower risk or higher screening levels. (Reference: USEPA. 2014. Determining Groundwater Exposure Point Concentrations. OSWER Directive 9283.1-42. February 2014.)

- ***2015 OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (EPA, 2015)***

In June 2015, EPA issued new guidance for evaluating the vapor intrusion pathway. This current EPA guidance recommends a tiered approach to evaluating the vapor intrusion pathway and examination of multiple lines of evidence to support conclusions, including evaluation of soil, groundwater, sub-slab soil gas, and indoor air. VISL Calculator (EPA, 2018) provides groundwater and sub-slab soil gas screening levels and is updated regularly to reflect changing toxicity values, exposure assumptions, and risk assessment methods.

These changes in the recommended approach to risk assessments that have occurred since the 2015 FYR do not affect the short-term protectiveness of the remedy because exposure to site contaminants is prevented by multi-layer cap and ICs in place which prohibit use of groundwater on-site.

Changes in Exposure Pathways

The ROD and ROD Amendment identified ingestion of overburden groundwater in a future residential use exposure pathway as the only unacceptable risk. Residences and businesses in the area near the Burgess property are provided with municipal water. The ICs in place prevent current and future residential use of groundwater at the Site.

Since the 2015 FYR the following changes have occurred in recommended exposure pathway considerations:

- ***2014 OSWER Directive on the Update of Standard Default Exposure Factors***

In 2014, EPA finalized a Directive to update standard default exposure factors and frequently asked questions associated with these updates (https://www.epa.gov/sites/production/files/2015-11/documents/oswer_directive_9200.1-120_exposurfactors_corrected2.pdf). Many of these exposure factors differ from those used in the risk assessment supporting the ROD. These changes in general would result in a slight decrease of the risk estimates for most chemicals. (Reference: EPA. 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1- 120. February 6, 2014.)

Expected Progress Towards Meeting RAOs

The RAOs for addressing threats to human health and the environment for the former landfill was achieved following the capping activities of the Landfill and Marshy Areas in 1999. RAOs for bedrock groundwater, surface water, and ecological impacts to surface water and sediment were included in the 1998 ROD; the 2011 ROD Amendment included additional RAOs for overburden groundwater. Trends in analytical data, combined with the institutional controls currently implemented at the Site provide protectiveness of human health and the environment as the remaining RAOs are expected to be met in the future.

QUESTION C: Has any **other** information come to light that could call into question the protectiveness of the remedy?

No. No other information has been discovered that would call into question the protectiveness of the remedy. Due to the location and elevation of the Site, impacts from conditions such as sea level rise, changes in precipitation, increasing risk of floods, changes in temperature, increasing intensity of hurricanes, increasing wildfires, and melting permafrost in northern regions are not expected to affect remedy protectiveness.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
Site-wide: None

OTHER FINDINGS

The following activities and suggestions were identified during the FYR but do not affect current or future protectiveness:

- Following a review of the 2019 Long-Term Monitoring Report and the groundwater data presented therein, EPA concurs with the proposal presented by the Settling PRPs to discontinue groundwater sampling for arsenic, lead, and thallium until the Demonstration of Compliance sampling event is performed. This modification to the sampling approach is consistent with the EPA-approved 2015 LTMP and is justified by the analytical data obtained from the Site.
- EPA recommends that 1,4-dioxane sampling at groundwater monitoring wells be conducted during future sampling events to further understand the nature, extent, and attenuation characteristics of the contaminant at the Site. The scope of the sampling event should be discussed in advance with EPA and the VTDEC.
- EPA recommends that PFAS sampling at groundwater monitoring wells be conducted during future sampling events to further understand the nature, extent, and attenuation characteristics of the contaminant at the Site. The scope of the sampling event should be discussed in advance with EPA and VTDEC.
- EPA recommends that the air stripper effluent and landfill gas discharge points be sampled for PFAS, and that the Settling PRPs study the impact of PFAS compounds on the effectiveness of the groundwater treatment system as currently designed.

VII. PROTECTIVENESS STATEMENT

Sitewide Protectiveness Statement	
<i>Protectiveness Determination:</i> Protective	<i>Planned Addendum Completion Date:</i> Not Applicable
<i>Protectiveness Statement:</i> The Site-wide remedy is protective of human health and the environment. Institutional controls have been recorded and the Landfill Area was successfully capped, preventing exposure to Site groundwater, soil, surface water, sediment, and landfill gas thereby ensuring the Site remains protective of human health. Additionally, the State of Vermont reclassified the groundwater beneath the Site to Class IV, restricting use for domestic water supply and the Grant of Environmental Protection Easement and Declaration of Restrictive Covenants further prohibits Site groundwater use for any purpose. The groundwater treatment system continues to operate at the Site, preventing the migration of Site contaminants in groundwater beyond the Groundwater Reclassification Boundary. Ongoing monitoring indicates that the size and magnitude of the groundwater plume is decreasing. Monitoring will continue to ensure protectiveness of the remedy.	

VIII. NEXT REVIEW

The next five-year review report for the Burgess Brothers Landfill Superfund Site is required five years from the completion date of this review.

APPENDIX A

Reference List

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Weston Solutions, Inc., Superfund Technical Assessment and Response Team IV (START).
(2016). *Groundwater, Surface Water, and Influent/Effluent Sampling Activities at the Burgess Brothers Landfill, Bennington/Woodford, Bennington County, Vermont.*

APPENDIX B

Site Chronology

Date	Event
1940s	Site was utilized as a sand and gravel operation.
Early 1950s – 1976	Site used as a metal salvage facility and disposal area for industrial waste, including solid, semi-solid and liquid wastes.
1967 – 1976	Portion of Site used for a liquid waste and sludge lagoon.
1976	Disposal operations ceased.
1976	VTAEC Site inspection; surface water and leachate samples collected.
1984 – 1989	Preliminary environmental investigations and monitoring performed by VTDEC, EPA, and Union Carbide Corporation.
1984	VTDEC conducted Preliminary Site Assessment.
1988	EPA proposed Site for listing on the National Priorities List (NPL).
1989	EPA added Site to NPL.
1991	EPA entered into Administrative Order by Consent (AOC) with PRPs to conduct a Remedial Investigation/Feasibility Study (RI/FS). Initiated multi-phase RI.
1994	Groundwater monitoring begins.
1997	RI and Baseline Risk Assessment completed.
1998	FS completed.
1998	EPA issued Record of Decision selecting a remedy.
1999	EPA, VTDEC and Settling PRPs entered into a Consent Decree for Remedial Design/Remedial Action (RD/RA) with Statement of Work included as Appendix A.
1999	Completed RD; Start of remedy construction.
2000	Site attained construction completion.
2000	Initiated Operation and Maintenance (O&M) of AS/SVE system.
2001	EPA approved Final Remedial Action Construction Report.
2001	EPA approved Post-Closure O&M Plan.
2001	Start of full-scale AS/SVE operation.
2002	AS shut down (SVE operation continued).
2003	Groundwater Reclassification Petition Approved by VTANR.
2004	Final Year 2 Remedy Evaluation Report.
2005	Grant of Environmental Protection Easement and Declaration of Restrictive Covenants recorded on portion of Burgess Brothers Construction Company property.
2005	SVE system shut down.
2005	First Five-Year Review Report issued.
2005	Settling PRPs performed additional field work in response to FYR Report.
2007	EPA requested a Focused Feasibility Study (FFS) be prepared to address groundwater contaminant plume and impact to surface water. SVE system restarted.
2008 – 2010	Long-term monitoring of groundwater, surface water and sediments continued.
2010	Second Five-Year Review Report issued.
2011	FFS completed.
2011	Proposed Plan released and public meeting held.
2011	Amended ROD signed.
2012	Statement of Work modified by EPA, VTDEC, and Settling PRPs.
2012	Pre-Design Investigation completed.

2013	Construction of two groundwater collection trenches and ex-situ treatment system initiated.
2014	Construction completed; system startup began; Baseline groundwater sampling event conducted.
2015	Modification to ex-situ treatment system to address colloidal iron.
2015	EPA approves Long Term Monitoring Plan (LTMP) for the Site.
2015	Third Five-Year Review Report issued.
2016	Groundwater, surface water, and system influent/effluent samples collected and analyzed for six selected per- and polyfluoroalkyl substances (PFAS).
2017	LTMP Year Two Groundwater Sampling conducted.
2019	LTMP Year Five Groundwater Sampling conducted.

APPENDIX C

Press Release



An official website of the United States government.



News Releases from Region 01

EPA Begins Review of Woodford, Vermont Superfund Site Cleanup

03/13/2020

Contact Information:

David Deegan (deegan.dave@epa.gov)
617-918-1017

BOSTON – The U.S. Environmental Protection Agency (EPA) will conduct a comprehensive review of previously completed site cleanup work at the Burgess Brothers Landfill in Woodford this year. The site, listed as a National Priorities List (NPL) Superfund site, will undergo a legally-required Five-Year Review to ensure that previous remediation efforts at the site continue to protect public health and the environment.

"It is a major EPA priority to make continued progress cleaning up Superfund sites across New England. Once cleanup work at all or a portion of a site is completed, EPA conducts regular periodic reviews of our previous work to ensure that it is continuing to protect human health and the environment," **said EPA New England Regional Administrator Dennis Deziel.**

"The Five-Year Review is an important step in the site rehabilitation process. The review helps confirm that the remediation work remains effective, giving confidence to Vermont citizens and groups who may be interested in redeveloping the site," **said Vermont Department of Environmental Conservation Commissioner Peter Walke.**

Background

The Superfund program, a federal program established by Congress in 1980, investigates and cleans up the most complex, uncontrolled or abandoned hazardous waste sites in the country and works to facilitate activities to return them to productive use. Under the Trump Administration, the Superfund program has reemerged as a priority to fulfill EPA's core mission of protecting human health and the environment. EPA is actively involved in Superfund studies and cleanups at 14 sites in Vermont. The Superfund cleanup process involves many phases, including consideration of the future use and redevelopment at the sites and post cleanup monitoring of sites. EPA must make sure remedies protect the public health and the environment and that any redevelopment will uphold that goal in the future.

More information

- Detailed information on the Burgess Brothers Landfill site, including past assessment and cleanup activity is available at www.epa.gov/superfund/burgess. Once the Five-Year Review is complete, its findings will be posted to the website in a final report.
- Superfund and other cleanup sites in New England:
<https://www.epa.gov/cleanups/cleaning-new-england>

LAST UPDATED ON MARCH 13, 2020

APPENDIX D

Interview Logs & Site Inspection Forms

INTERVIEW DOCUMENTATION FORM

The following is a list of individual interviewed for this five-year review. See the attached contact record(s) for a detailed summary of the interviews.

Geoff Seibel	Project Coordinator	de maximis, Inc.	4/30/20
Name	Title/Position	Organization	Date
Gerold Noyes, P.E.	Project Manager	VTDEC	4/30/20
Name	Title/Position	Organization	Date
Stuart Hurd	Town Manager	Town of Bennington, VT	6/8/20
Name	Title/Position	Organization	Date
Susan Wright	Town Clerk	Town of Woodford, VT	6/8/20
Name	Title/Position	Organization	Date
Glen Sauer	Homeowner	N/A	6/23/20
Name	Title/Position	Organization	Date
Name	Title/Position	Organization	Date

INTERVIEW RECORD			
Site Name: Burgess Brothers Landfill NPL Site		EPA ID No.: VTD003965415	
Subject: 2020 Five-Year Review Interview		Time: 0700	Date: 4/30/20
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> E-Mail Location of Visit: N/A		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	
Contact Made By:			
Name: Chris Kelly	Title: Hydrogeologist	Organization: U.S EPA	
Individual Contacted:			
Name: Geoff Seibel	Title: Project Coordinator	Organization: de maximis, Inc.	
Telephone No: 610-435-1151 Fax No: N/A E-Mail Address: gcs@demaximis.com		Street Address: 1550 Pond Road City, State, Zip: Suite 120 Allentown, PA 18104	
Summary Of Conversation			
<p>1. What is your overall impression of the project? (general sentiment)</p> <p>"My overall impression of the project is that it is being well maintained, monitored and managed in a cooperative manner by the PRP Group and EPA such that the remedy continues to protect human health and the environment and will continue to do so into the foreseeable future."</p> <p>2. Is the remedy functioning as expected? How well is the remedy performing?</p> <p>"The remedy is functioning as expected. The remedy's performance has also been within (or exceeding) expectations as demonstrated by the environmental and operational monitoring data."</p> <p>3. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?</p> <p>"The monitoring data shows that the system is meeting its performance objectives both in terms of operational and environmental monitoring. Levels of COCs in groundwater have significantly declined since the remedy was modified. Hydraulic capture is being maintained."</p>			

INTERVIEW RECORD			
Site Name: Burgess Brothers Landfill NPL Site		EPA ID No.: VTD003965415	
Subject: 2020 Five-Year Review Interview		Time: 0700	Date: 4/30/20
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> E-Mail Location of Visit: N/A		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	
Contact Made By:			
Name: Chris Kelly	Title: Hydrogeologist	Organization: U.S EPA	
Individual Contacted:			
Name: Geoff Seibel	Title: Project Coordinator	Organization: de maximis, Inc.	
Telephone No: 610-435-1151 Fax No: N/A E-Mail Address: gcs@demaximis.com		Street Address: 1550 Pond Road City, State, Zip: Suite 120 Allentown, PA 18104	
Summary Of Conversation			
<p>4. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.</p> <p>"There is not continuous O&M presence at the Site. The system is designed to operate unsupervised with a Programmable Logic Controller (PLC). Monitoring is largely accomplished by a Supervisory Control and Data Acquisition (SCADA) system that collects measurement of groundwater extraction flow rates, system pressures, pump cycling times, groundwater discharge volumes and temperatures within the process stream. Regular site visits are performed for general maintenance purposes, such as replacing system particulate filters, cleaning and replacing air stripper trays, pump/blower replacement and repair, system performance and compliance sampling, general maintenance, and site inspections. These site visits occur on a weekly or biweekly basis, and the maintenance activities are recorded in a log for inclusion in reports.</p> <p>A larger-scale maintenance program is performed during the fall of each year, which includes cleaning of the collector trench extraction pumps and conveyance lines, and a thorough cleaning of the collector trench and treatment system pumping systems. Conducting this extensive maintenance routinely every fall has enabled the system to continue operations through the winter season."</p>			

INTERVIEW RECORD			
Site Name: Burgess Brothers Landfill NPL Site		EPA ID No.: VTD003965415	
Subject: 2020 Five-Year Review Interview		Time: 0700	Date: 4/30/20
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> E-Mail Location of Visit: N/A		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	
Contact Made By:			
Name: Chris Kelly	Title: Hydrogeologist	Organization: U.S EPA	
Individual Contacted:			
Name: Geoff Seibel	Title: Project Coordinator	Organization: de maximis, Inc.	
Telephone No: 610-435-1151 Fax No: N/A E-Mail Address: gcs@demaximis.com		Street Address: 1550 Pond Road City, State, Zip: Suite 120 Allentown, PA 18104	
Summary Of Conversation			
<p>5. Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.</p> <p>"There have been no changes in the O&M requirements or sampling routines since start-up or in the last five years. As noted above in the answer to Question #4, the maintenance schedule was modified in 2016 to include an annual system clean-out in the fall of each year. Further, dataloggers will be removed from the wells monitoring water levels beyond the trench and manual measurements will continue to document hydraulic control."</p> <p>6. Have there been unexpected O&M difficulties or costs at the site since start-up or in the last five years? If so, please give details.</p> <p>"As indicated in the response to Question #5, the O&M schedule was modified in 2016 to include an annual system clean-out in the fall. This has included cleaning of the conveyance lines to remove significant iron buildup as a result of naturally occurring iron levels in groundwater. An inventory of spare parts are maintained at the site that allows a rapid response to unanticipated interruptions that occur as a result of weather events, all as documented in the annual operations report provided to EPA."</p>			

INTERVIEW RECORD			
Site Name: Burgess Brothers Landfill NPL Site		EPA ID No.: VTD003965415	
Subject: 2020 Five-Year Review Interview		Time: 0700	Date: 4/30/20
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> E-Mail Location of Visit: N/A		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	
Contact Made By:			
Name: Chris Kelly	Title: Hydrogeologist	Organization: U.S EPA	
Individual Contacted:			
Name: Geoff Seibel	Title: Project Coordinator	Organization: de maximis, Inc.	
Telephone No: 610-435-1151 Fax No: N/A E-Mail Address: gcs@demaximis.com		Street Address: 1550 Pond Road City, State, Zip: Suite 120 Allentown, PA 18104	
Summary Of Conversation			
<p>7. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.</p> <p>"After consultation with EPA, the frequency of influent and effluent sampling was reduced from monthly to quarterly after June 2016. Manual groundwater level gauging was reduced from semi-annually to annually starting in 2018. This monitoring frequency is consistent with the approach described in the Operation and Maintenance Plan and has resulted in cost savings."</p> <p>8. Do you have any comments, suggestions, or recommendations regarding the project?</p> <p>"Not at this time."</p>			

INTERVIEW RECORD

Site Name: Burgess Brothers Landfill NPL Site		EPA ID No.: VTD003965415	
Subject: 2020 Five-Year Review Interview		Time: 0700	Date: 4/30/20
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> E-Mail Location of Visit: N/A		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	
Contact Made By:			
Name: Chris Kelly	Title: Hydrogeologist	Organization: U.S. EPA	
Individual Contacted:			
Name: Gerold Noyes	Title: Project Manager	Organization: VTDEC	
Telephone No: 802-522-5614 Fax No: N/A E-Mail Address: gerold.noyes@vermont.gov		Street Address: 1 National Life Drive – Davis 1 City, State, Zip: Montpelier, VT 05620-3704	
Summary Of Conversation			
<p>1. What is your overall impression of the project? (general sentiment)</p> <p>"Seems to be working to control the impact to groundwater. I am concerned that a pump and treat system will only control the site, it will not remediate the site. There are still 1000's if not 10000's # of product on site and it is being removed through treatment of dissolved phase contamination. It will not be clean before I retire or even in my lifetime. One day someone will cut the funding, stop powering and maintaining the pumps and the site will be back to the condition it was when the treatment system was first turned on. Until then, full employment for EPG."</p> <p>2. What effects have site operations had on the surrounding community?</p> <p>"None that I am aware of."</p> <p>3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.</p> <p>"Only occasionally, about once every year or 2 I'll get a citizen call along the lines of '...I have cancer, I heard there is a Superfund site in Bennington, could this be the cause of my illness?'"</p>			

INTERVIEW RECORD

Site Name: Burgess Brothers Landfill NPL Site		EPA ID No.: VTD003965415	
Subject: 2020 Five-Year Review Interview		Time: 0700	Date: 4/30/20
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> E-Mail Location of Visit: N/A		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	
Contact Made By:			
Name: Chris Kelly	Title: Hydrogeologist	Organization: U.S. EPA	
Individual Contacted:			
Name: Gerold Noyes	Title: Project Manager	Organization: VTDEC	
Telephone No: 802-522-5614 Fax No: N/A E-Mail Address: gerold.noyes@vermont.gov		Street Address: 1 National Life Drive – Davis 1 City, State, Zip: Montpelier, VT 05620-3704	
Summary Of Conversation			
<p>4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.</p> <p>"No."</p> <p>5. Do you feel well informed about the site's activities and progress?</p> <p>"No."</p> <p>6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?</p> <p>"I would like to be included on e-mails, communication, etc. between EPA and the RPs and their consultant."</p>			

INTERVIEW RECORD			
Site Name: Burgess Brothers Landfill NPL Site		EPA ID No.: VTD003965415	
Subject: 2020 Five-Year Review Interview		Time: 1230	Date: 6/8/20
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> E-Mail Location of Visit: N/A		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	
Contact Made By:			
Name: Darriel Swatts	Title: Community Involvement Coordinator	Organization: U.S. EPA	
Individual Contacted:			
Name: Stuart Hurd	Title: Town Manager	Organization: Town of Bennington, VT	
Telephone No: 802-442-1037 Fax No: E-Mail Address: shurd@benningtonvt.org		Street Address: P.O. Box 469 City, State, Zip: Bennington, VT 05201	
Summary Of Conversation			
<p>1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?</p> <p>"Yes."</p> <p>2. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?</p> <p>"Initially, I was very well informed. As of late less so. That must mean things are going well."</p> <p>3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?</p> <p>"No."</p> <p>4. Are you aware of any changes to state laws or local regulations that might affect the protectiveness of the Site's remedy?</p> <p>"No."</p>			

INTERVIEW RECORD			
Site Name: Burgess Brothers Landfill NPL Site		EPA ID No.: VTD003965415	
Subject: 2020 Five-Year Review Interview		Time: 1230	Date: 6/8/20
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> E-Mail Location of Visit: N/A		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	
Contact Made By:			
Name: Darriel Swatts		Title: Community Involvement Coordinator	
		Organization: U.S. EPA	
Individual Contacted:			
Name: Stuart Hurd		Title: Town Manager	
		Organization: Town of Bennington, VT	
Telephone No: 802-442-1037		Street Address: P.O. Box 469	
Fax No:		City, State, Zip: Bennington, VT 05201	
E-Mail Address: shurd@benningtonvt.org			
Summary Of Conversation			
<p>5. Are you aware of any changes in projected land use(s) at the Site?</p> <p>"No."</p> <p>6. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?</p> <p>"As I stated, lately there has not been as much contact from EPA."</p> <p>7. Do you have any comments, suggestions or recommendations regarding the project?</p> <p>"None."</p> <p>8. Do you consent to have your name included along with your responses to this questionnaire in the FYR report?</p> <p>"Yes."</p>			

INTERVIEW RECORD			
Site Name: Burgess Brothers Landfill NPL Site		EPA ID No.: VTD003965415	
Subject: 2020 Five-Year Review Interview		Time: 1245	Date: 6/8/20
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> E-Mail Location of Visit: N/A		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	
Contact Made By:			
Name: Darriel Swatts	Title: Community Involvement Coordinator	Organization: U.S. EPA	
Individual Contacted:			
Name: Susan Wright	Title: Town Clerk	Organization: Town of Woodford, VT	
Telephone No: 802-442-4895 Fax No: E-Mail Address: woodfordvt@comcast.net		Street Address: 1391 VT-9 City, State, Zip: Woodford, VT 05201	
Summary Of Conversation			
<p>1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?</p> <p>"Not really."</p> <p>2. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?</p> <p>"No. Any form would be nice."</p> <p>3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?</p> <p>"Not to our knowledge."</p> <p>4. Are you aware of any changes to state laws or local regulations that might affect the protectiveness of the Site's remedy?</p> <p>"No."</p>			

INTERVIEW RECORD			
Site Name: Burgess Brothers Landfill NPL Site		EPA ID No.: VTD003965415	
Subject: 2020 Five-Year Review Interview		Time: 1245	Date: 6/8/20
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> E-Mail Location of Visit: N/A		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	
Contact Made By:			
Name: Darriel Swatts		Title: Community Involvement Coordinator	
		Organization: U.S. EPA	
Individual Contacted:			
Name: Susan Wright		Title: Town Clerk	
		Organization: Town of Woodford, VT	
Telephone No: 802-442-4895		Street Address: 1391 VT-9	
Fax No:		City, State, Zip: Woodford, VT 05201	
E-Mail Address: woodfordvt@comcast.net			
Summary Of Conversation			
<p>5. Are you aware of any changes in projected land use(s) at the Site?</p> <p>"No."</p> <p>6. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?</p> <p>The Town did not respond directly to the question.</p> <p>7. Do you have any comments, suggestions or recommendations regarding the project?</p> <p>"Clean it."</p> <p>8. Do you consent to have your name included along with your responses to this questionnaire in the FYR report?</p> <p>Yes, "Keep Woodford Town Clerk informed."</p>			

INTERVIEW RECORD			
Site Name: Burgess Brothers Landfill NPL Site		EPA ID No.: VTD003965415	
Subject: 2020 Five-Year Review Interview		Time: 1030	Date: 6/23/20
Type: <input checked="" type="checkbox"/> Telephone <input type="checkbox"/> Visit <input type="checkbox"/> E-Mail Location of Visit: N/A		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	
Contact Made By:			
Name: Darriel Swatts	Title: Community Involvement Coordinator	Organization: U.S. EPA	
Individual Contacted:			
Name: Glen Sauer	Title: Homeowner	Organization: N/A	
Telephone No: 802-447-2692 Fax No: E-Mail Address:		Street Address: 1236 Burgess Road City, State, Zip: Bennington, VT 05201	
Summary Of Conversation			
<p>1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?</p> <p>"Yes."</p> <p>2. What is your overall impression of the project, including the cleanup and maintenance activities?</p> <p>"Excessive - my grandfather is Mr. Burgess. It just seems like it keeps going on and on, but the guys who come out here are great. Like, when does it stop?"</p> <p>3. To the best of your knowledge, what have been the effects of the Site on the surrounding community?</p> <p>"Most people don't think about it. When they did whatever they did back then, it was all legal back in the day but laws change, rules change. It doesn't affect my day at all and I'm the closest person to it."</p> <p>4. Have there been any problems with unusual or unexpected activities at the Site, such as trespassing, vandalism, or emergency responses?</p> <p>"No."</p>			

INTERVIEW RECORD

Site Name: Burgess Brothers Landfill NPL Site		EPA ID No.: VTD003965415	
Subject: 2020 Five-Year Review Interview		Time: 1030	Date: 6/23/20
Type: <input checked="" type="checkbox"/> Telephone <input type="checkbox"/> Visit <input type="checkbox"/> E-Mail Location of Visit: N/A		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	
Contact Made By:			
Name: Darriel Swatts	Title: Community Involvement Coordinator	Organization: U.S. EPA	
Individual Contacted:			
Name: Glen Sauer	Title: Homeowner	Organization: N/A	
Telephone No: 802-447-2692		Street Address: 1236 Burgess Road	
Fax No:		City, State, Zip: Bennington, VT 05201	
E-Mail Address:			
Summary Of Conversation			
<p>5. Has EPA kept involved parties such as yourself informed about any activities happening at the Site?</p> <p>"For the most part, they know I'm a phone call away if they need something. Very rarely I would get a call from someone asking to go check on something, but its been years since that's happened. So I would say yeah, no problems."</p> <p>6. How can EPA best provide Site-related information?</p> <p>A phone call could be the best option for Mr. Sauer.</p> <p>7. Do you have any comments, suggestions or recommendations regarding the project?</p> <p>"When is it going to wrap up? Or will it ever?"</p>			

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION			
Site Name: Burgess Brothers Landfill NPL Site	Date of inspection: 6/23/2020		
Location and Region: Bennington, VT - U.S. EPA R1	EPA ID: VTD003965415		
Agency, office, or company leading the five-year review: U.S. EPA	Weather/temperature: 78F, Sunny		
Remedy Includes: (Check all that apply) <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input checked="" type="checkbox"/> Landfill cover/containment <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input checked="" type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other _____ </div> <div style="width: 50%;"> <input checked="" type="checkbox"/> Monitored natural attenuation <input checked="" type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls </div> </div>			
Attachments: <input type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached			
II. INTERVIEWS (Check all that apply)			
1. O&M site manager _____ Geoff Seibel _____ Project Coordinator _____ 4/30/2020 _____ <div style="display: flex; justify-content: space-between;"> Name Title Date </div> <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> at site <input checked="" type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____ </div> Problems, suggestions; <input checked="" type="checkbox"/> Report attached _____			
2. O&M staff _____ _____ _____ <div style="display: flex; justify-content: space-between;"> Name Title Date Int </div> <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____ </div> Problems, suggestions; <input type="checkbox"/> Report attached _____			

Mr. Glen Sauer, Homeowner, 1236 Burgess Road, Bennington, VT 05201

Current Resident, 286 Garbrooke Drive, Bennington, VT 05201

Current Resident, 1425 Burgess Road, Bennington, VT 05201

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1.	O&M Documents <input checked="" type="checkbox"/> O&M manual <input checked="" type="checkbox"/> As-built drawings <input checked="" type="checkbox"/> Maintenance logs Remarks _____	<input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A
2.	Site-Specific Health and Safety Plan <input checked="" type="checkbox"/> Contingency plan/emergency response plan Remarks _____	<input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A <input type="checkbox"/> N/A
3.	O&M and OSHA Training Records Remarks _____	<input type="checkbox"/> Readily available Maintained electronically by PRP consultants.	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
4.	Permits and Service Agreements <input checked="" type="checkbox"/> Air discharge permit <input checked="" type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A
5.	Gas Generation Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
6.	Settlement Monument Records Remarks _____	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> N/A
7.	Groundwater Monitoring Records Remarks _____	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
8.	Leachate Extraction Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
9.	Discharge Compliance Records <input checked="" type="checkbox"/> Air <input checked="" type="checkbox"/> Water (effluent) Remarks _____	<input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A <input type="checkbox"/> N/A
10.	Daily Access/Security Logs Remarks _____	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A

IV. O&M COSTS**1. O&M Organization**

- ☐ State in-house ☐ Contractor for State
☐ PRP in-house ☒ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other _____

2. O&M Cost Records

- ☐ Readily available ☒ Up to date
☒ Funding mechanism/agreement in place
 Original O&M cost estimate _____ ☐ Breakdown att.

Total annual cost by year for review period if available

From _____	To _____	_____ <input type="checkbox"/> Breakdown attached
Date	Date	Total cost
From _____	To _____	_____ <input type="checkbox"/> Breakdown attached
Date	Date	Total cost
From _____	To _____	_____ <input type="checkbox"/> Breakdown attached
Date	Date	Total cost
From _____	To _____	_____ <input type="checkbox"/> Breakdown attached
Date	Date	Total cost
From _____	To _____	_____ <input type="checkbox"/> Breakdown attached
Date	Date	Total cost

3. Unanticipated or Unusually High O&M Costs During Review Period

Describe costs and reasons:

None reported.

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A**A. Fencing**

- 1. Fencing damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A
 Remarks _____ Fencing is in good condition and remains locked when Site is unattended.

B. Other Access Restrictions

- 1. Signs and other security measures** ☒ Location shown on site map ☐ N/A
 Remarks _____ Signage is visible and in good condition. Information on signage is appropriate.

C. Institutional Controls (ICs)**1. Implementation and enforcement**

Site conditions imply ICs not properly implemented

☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced

☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by) _____ N/A

Frequency _____ N/A

Responsible party/agency _____ U.S. EPA/VTDEC

Contact	Ronald Jennings	RPM	N/A	617-918-1242
	Name	Title	Date	Phone no.

Reporting is up-to-date

☒ Yes ☐ No ☐ N/A

Reports are verified by the lead agency

☐ Yes ☐ No ☐ N/ASpecific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A

Violations have been reported

☐ Yes ☒ No ☐ N/AOther problems or suggestions: ☐ Report attached**2. Adequacy**☒ ICs are adequate☐ ICs are inadequate☐ N/A

Remarks _____ Main IC is a groundwater reclassification for ~12 acres beneath the landfill.

D. General**1. Vandalism/trespassing**☐ Location shown on site map☒ No vandalism evident

Remarks _____

2. Land use changes on site ☒ N/A

Remarks _____

3. Land use changes off site ☒ N/A

Remarks _____

VI. GENERAL SITE CONDITIONS**A. Roads**☒ Applicable☐ N/A**1. Roads damaged**☐ Location shown on site map☒ Roads adequate☐ N/A

Remarks _____ Mud season (spring) poses a challenge for entry/exit to the Site.

O&M contractor to improve road conditions.

B. Other Site Conditions

Remarks

A beaver dam is evident on the southeast portion of the Site where the Unnamed Stream flows adjacent to Clyde's Swale. PRP consultant will focus first on trees that may fall and damage the fencing abutting the landfill.

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

- | | | | |
|----|---|---|---|
| 1. | Settlement (Low spots)
evident Areal extent <u>N/A</u> | <input type="checkbox"/> Location shown on site map | <input checked="" type="checkbox"/> Settlement not |
| | Depth _____
Remarks _____
_____ | | |
| 2. | Cracks
evident Lengths _____ Widths _____ Depths _____ | <input type="checkbox"/> Location shown on site map | <input checked="" type="checkbox"/> Cracking not |
| | Remarks _____
_____ | | |
| 3. | Erosion
evident Areal extent _____ | <input type="checkbox"/> Location shown on site map
Depth _____ | <input checked="" type="checkbox"/> Erosion not |
| | Remarks _____
_____ | | |
| 4. | Holes
evident Areal extent _____ | <input type="checkbox"/> Location shown on site map
Depth _____ | <input checked="" type="checkbox"/> Holes not |
| | Remarks _____
_____ | | |
| 5. | Vegetative Cover | <input checked="" type="checkbox"/> Grass | <input type="checkbox"/> Cover properly established |
| | <input checked="" type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram)
Remarks Small shrubs beginning to grow within riprap of drainage swales - will be removed by O&M contractor. | | <input type="checkbox"/> No signs of stress |
| 6. | Alternative Cover (armored rock, concrete, etc.) | <input checked="" type="checkbox"/> N/A | |
| | Remarks _____
_____ | | |
| 7. | Bulges
evident Areal extent _____ | <input type="checkbox"/> Location shown on site map
Height _____ | <input checked="" type="checkbox"/> Bulges not |
| | Remarks _____
_____ | | |

8.	Wet Areas/Water Damage <input type="checkbox"/> Wet areas <input type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade Remarks _____ _____	<input checked="" type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Location shown on site map Areal extent _____ <input type="checkbox"/> Location shown on site map Areal extent _____ <input type="checkbox"/> Location shown on site map Areal extent _____ <input type="checkbox"/> Location shown on site map Areal extent _____
9.	Slope Instability <input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No evidence of slope instability Areal extent _____ Remarks _____ _____	
B. Benches <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	Flows Bypass Bench Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> N/A or okay
2.	Bench Breached Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> N/A or okay
3.	Bench Overtopped Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> N/A or okay
C. Letdown Channels <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend the steep side slope of the cover and will allow the runoff water collected by the benches to move off the landfill cover without creating erosion gullies.)		
1.	Settlement <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No evidence of settlement Areal extent _____ Depth _____ Remarks _____ _____	
2.	Material Degradation <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No evidence of degradation Material type _____ Areal extent _____ Remarks _____ _____	
3.	Erosion <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No evidence of erosion Areal extent _____ Depth _____ Remarks _____ _____	

4.	Undercutting <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No evidence of undercutting Areal extent _____ Depth _____ Remarks _____ _____
5.	Obstructions Type _____ Vegetative _____ <input type="checkbox"/> No obstructions <input checked="" type="checkbox"/> Location shown on site map Areal extent _____ Sparse _____ Size _____ Remarks _____ Small vegetation to be removed by O&M contractor. _____
6.	Excessive Vegetative Growth Type _____ <input checked="" type="checkbox"/> No evidence of excessive growth <input type="checkbox"/> Vegetation in channels does not obstruct flow <input type="checkbox"/> Location shown on site map Areal extent _____ Remarks _____ _____
D. Cover Penetrations <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	Gas Vents <input type="checkbox"/> Active <input checked="" type="checkbox"/> Passive <input checked="" type="checkbox"/> Properly secured/locked <input checked="" type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____
2.	Gas Monitoring Probes <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____ _____
3.	Monitoring Wells (within surface area of landfill) <input checked="" type="checkbox"/> Properly secured/locked <input checked="" type="checkbox"/> Functioning <input checked="" type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____
4.	Leachate Extraction Wells <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____ _____
5.	Settlement Monuments <input type="checkbox"/> Located <input type="checkbox"/> Routinely surveyed <input checked="" type="checkbox"/> N/A Remarks _____ _____

E. Gas Collection and Treatment			<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Gas Treatment Facilities <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____			
2.	Gas Collection Wells, Manifolds and Piping <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____			
3.	Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____			
F. Cover Drainage Layer			<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	Outlet Pipes Inspected <input checked="" type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____			
2.	Outlet Rock Inspected <input checked="" type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____			
G. Detention/Sedimentation Ponds			<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Siltation Areal extent _____ Depth _____ <input type="checkbox"/> N/A <input type="checkbox"/> Siltation not evident Remarks _____ _____			
2.	Erosion Areal extent _____ Depth _____ <input type="checkbox"/> Erosion not evident Remarks _____ _____			
3.	Outlet Works <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____			
4.	Dam <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____			

H. Retaining Walls <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	Deformations <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Deformation not evident Horizontal displacement_____ Rotational displacement_____ Vertical displacement_____ Remarks_____	
2.	Degradation <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Degradation not evident Remarks_____	
I. Perimeter Ditches/Off-Site Discharge <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	Siltation <input checked="" type="checkbox"/> Location shown on site map <input type="checkbox"/> Siltation not evident Areal extent_____ Depth_____ Remarks_____ Naturally occurring iron oxidation observed.	
2.	Vegetative Growth <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Vegetation does not impede flow Areal extent_____ Type_____ Remarks_____	
3.	Erosion <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Erosion not evident Areal extent_____ Depth_____ Remarks_____	
4.	Discharge Structure <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A Remarks_____	
VIII. VERTICAL BARRIER WALLS <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	Settlement <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident Areal extent_____ Depth_____ Remarks_____	
2.	Performance Monitoring Type of monitoring_____ <input type="checkbox"/> Performance not monitored Frequency_____ <input type="checkbox"/> Evidence of breaching Head differential_____ Remarks_____	

IX. GROUNDWATER/SURFACE WATER REMEDIES <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines <input type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	Pumps, Wellhead Plumbing, and Electrical <input checked="" type="checkbox"/> Good condition <input checked="" type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ 97% uptime for the GWETS; SCADA system installed for remote alerts. _____ _____
2.	Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	Spare Parts and Equipment <input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____
B. Surface Water Collection Structures, Pumps, and Pipelines <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	Collection Structures, Pumps, and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
2.	Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	Spare Parts and Equipment <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____

C. Treatment System <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	Treatment Train (Check components that apply) <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div> <input checked="" type="checkbox"/> Metals removal <input checked="" type="checkbox"/> Air stripping <input checked="" type="checkbox"/> Filters <input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____ <input type="checkbox"/> Others _____ <input checked="" type="checkbox"/> Good condition </div> <div> <input type="checkbox"/> Oil/water separation <input checked="" type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> Sampling ports properly marked and functional <input checked="" type="checkbox"/> Sampling/maintenance log displayed and up to date <input checked="" type="checkbox"/> Equipment properly identified <input checked="" type="checkbox"/> Quantity of groundwater treated annually <u>1,955,220 gal</u> <input checked="" type="checkbox"/> Quantity of surface water treated annually <u>0 gal</u> </div> <div> <input type="checkbox"/> Bioremediation </div> </div> Remarks <u>Majority of "metals removal" completed through sedimentation tanks.</u>
2.	Electrical Enclosures and Panels (properly rated and functional) <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____
3.	Tanks, Vaults, Storage Vessels <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input checked="" type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks _____
4.	Discharge Structure and Appurtenances <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____
5.	Treatment Building(s) <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input checked="" type="checkbox"/> Chemicals and equipment properly stored Remarks _____
6.	Monitoring Wells (pump and treatment remedy) <div style="display: flex; justify-content: space-between;"> <div> <input checked="" type="checkbox"/> Properly secured/locked <input checked="" type="checkbox"/> All required wells located </div> <div> <input checked="" type="checkbox"/> Functioning <input type="checkbox"/> Needs Maintenance </div> <div> <input checked="" type="checkbox"/> Routinely sampled <input type="checkbox"/> N/A </div> </div> <input checked="" type="checkbox"/> Good condition Remarks _____
D. Monitoring Data	
1.	Monitoring Data <input checked="" type="checkbox"/> Is routinely submitted on time <input checked="" type="checkbox"/> Is of acceptable quality
2.	Monitoring data suggests: <input checked="" type="checkbox"/> Groundwater plume is effectively contained <input checked="" type="checkbox"/> Contaminant concentrations are declining

D. Monitored Natural Attenuation1. **Monitoring Wells** (natural attenuation remedy)

☒ Properly secured/locked
 ☒ Functioning
 ☒ Routinely sampled
 ☒ Good condition
☒ All required wells located
 ☐ Needs Maintenance
 ☐ N/A

Remarks _____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS**A. Implementation of the Remedy**

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The current remedy is designed to contain and treat impacted groundwater from three different zones on the Site: Areas A, B, and C. Groundwater impacts to Areas A and B are being addressed through two interceptor trenches that depress the surrounding water table and capture cVOC-impacted groundwater as it flows from the source (former lagoons) to the Unnamed Stream. Area C groundwater is being addressed through monitored natural attenuation (MNA).

Analytical results generally indicate that the remedy is functioning as intended and cVOC concentrations are stable or decreasing.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. Discuss their relationship to the current and long-term protectiveness of the remedy.

Following construction completion, fouling issues related to dissolved iron in extracted groundwater were hampering the performance of the treatment system. Sedimentation holding tanks were added to the treatment to allow for solids to precipitate (via gravity) prior to entering the carbon units, which increased the uptime of the system substantially.

The main O&M challenge currently cited is the remoteness of the Site for field crews to maintenance and sample. The currently installed SCADA system allows for remote alerts related to system shut downs to be sent, which has reduced the required O&M frequency (currently monthly).

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

None observed.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

EPA has approved the request of the Settling PRPs to reduce the sampling frequency of certain metals that have historically been below ROD cleanup goal, and to remove currently deployed transducers.

**PHOTODOCUMENTATION LOG
BURGESS BROTHERS LANDFILL SUPERFUND SITE
FIVE-YEAR REVIEW SITE VISIT – JUNE 23, 2020
BENNINGTON & WOODFORD, VERMONT**



SCENE: View of the landfill cap facing south, monitoring wells associated with the former waste lagoons, and the treatment system shed are shown.



SCENE: Signage affixed to the treatment system building.



SCENE: View of the Area A interceptor trench, associated manway covers, monitoring wells, and piezometers.



SCENE: View of the Area B interceptor trench, associated manway covers, monitoring wells, and piezometers. The manways are secured with fencing.



SCENE: View of the Unnamed Stream facing north, adjacent to the landfill fencing. Ponding due to a beaver dam was observed; dead trees to be removed. Iron oxidation is naturally occurring in the Unnamed Stream.



SCENE: View of the treatment system plumbing, filters, and sedimentation tanks. System is appropriately labeled and sufficiently maintained.

FIGURES



FIGURE 1
Site Location Map

Burgess Brothers Landfill
Superfund Site
Bennington & Woodford, Vermont



Scale 1 : 32,000



Feet
0 5,000

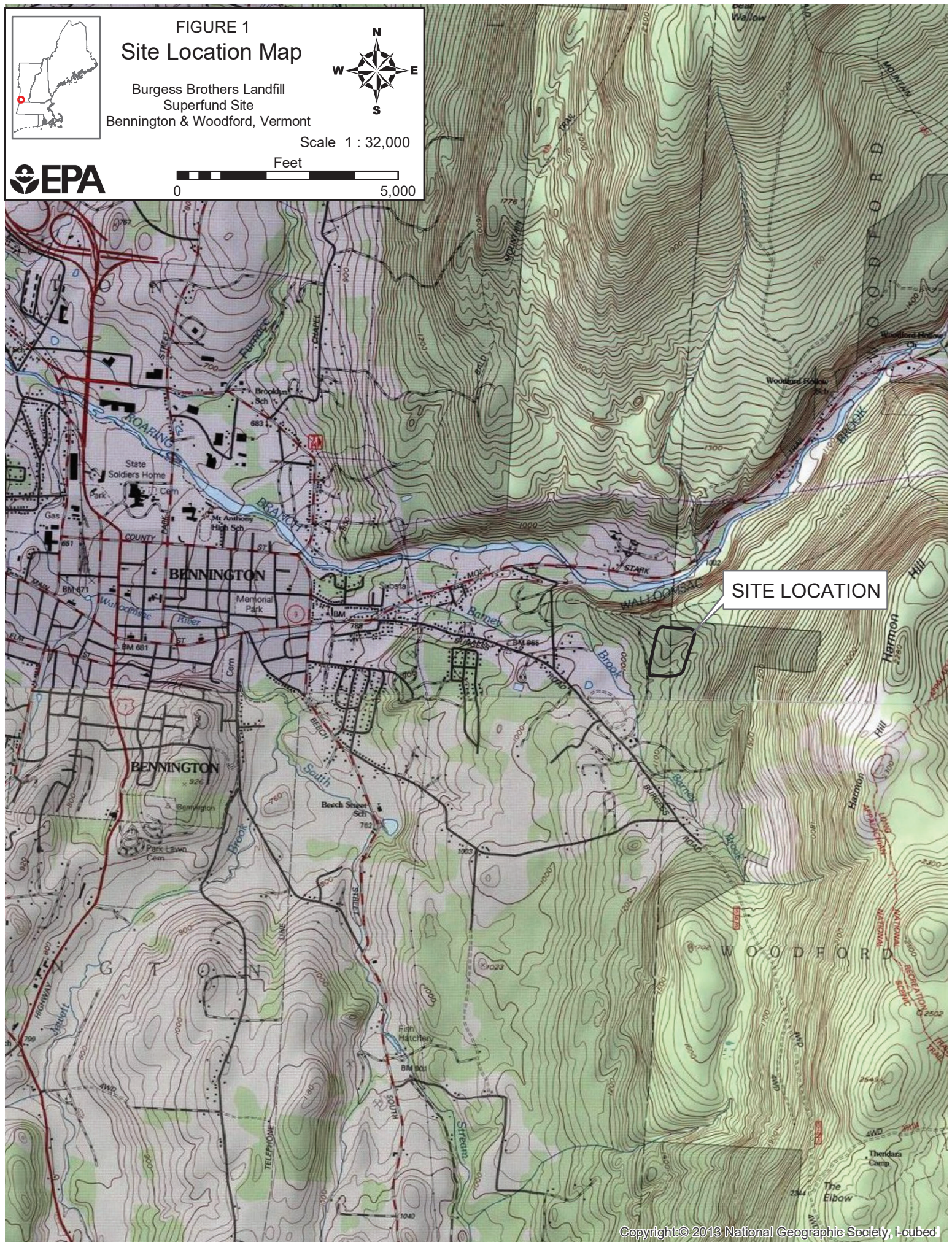
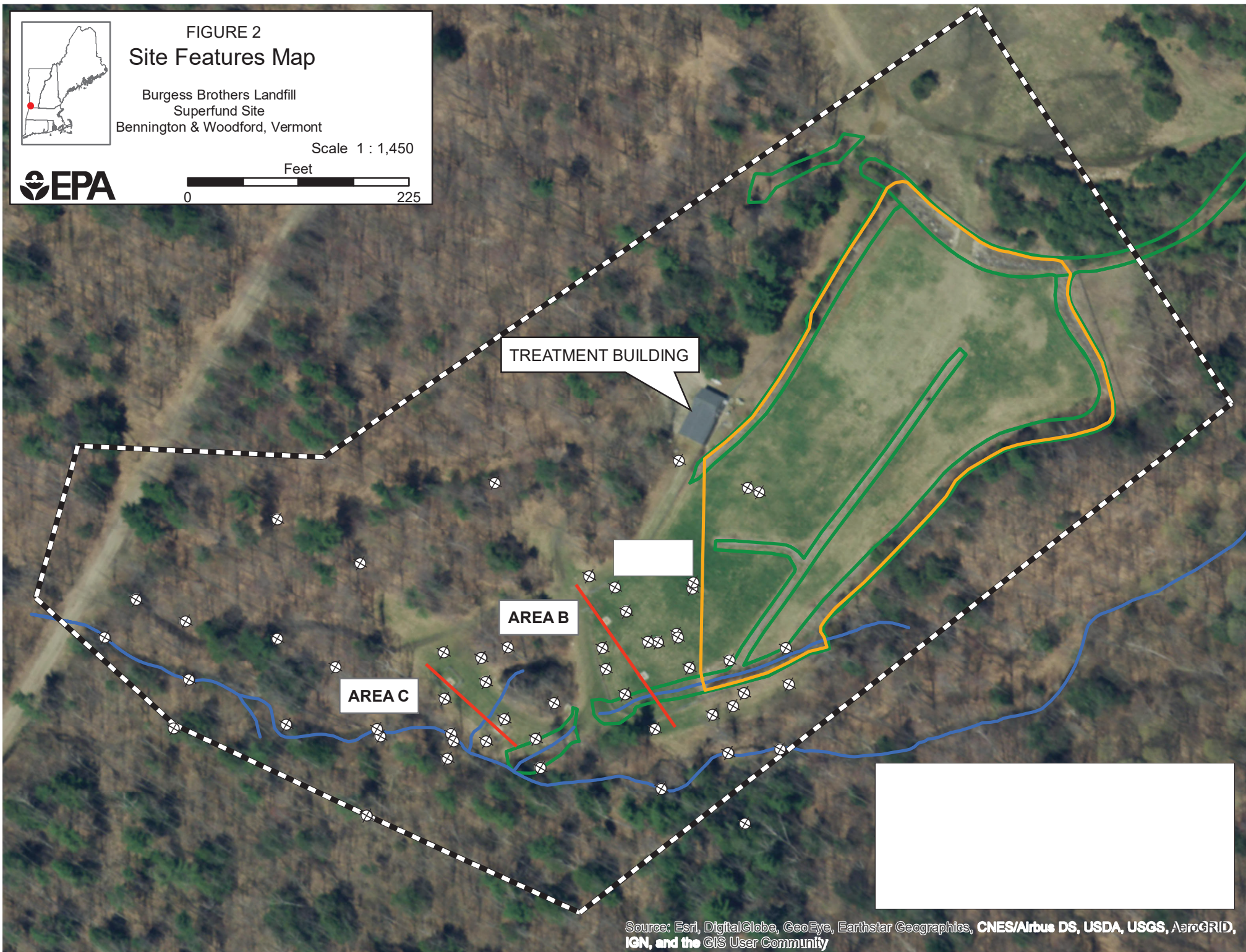




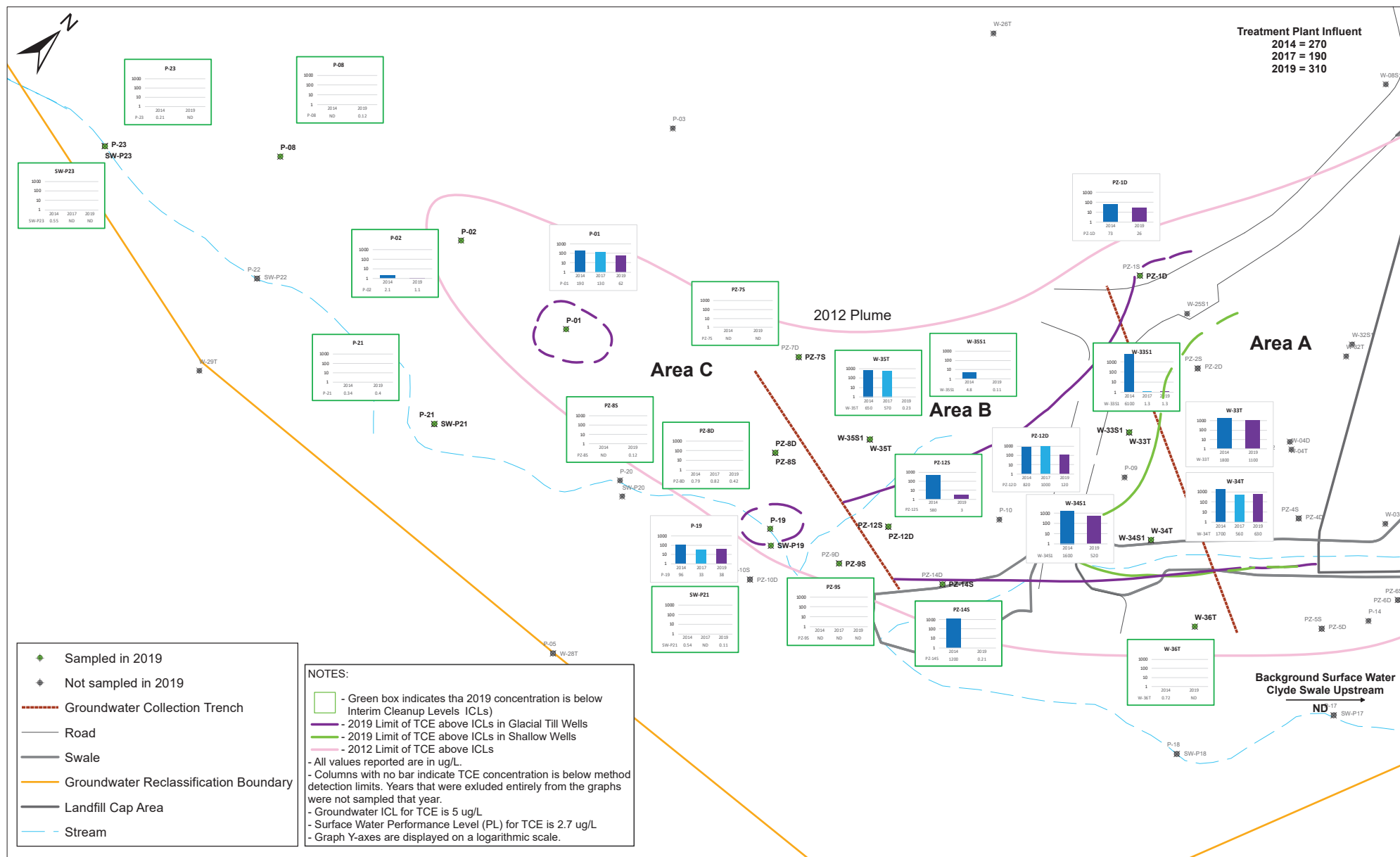
FIGURE 2 Site Features Map

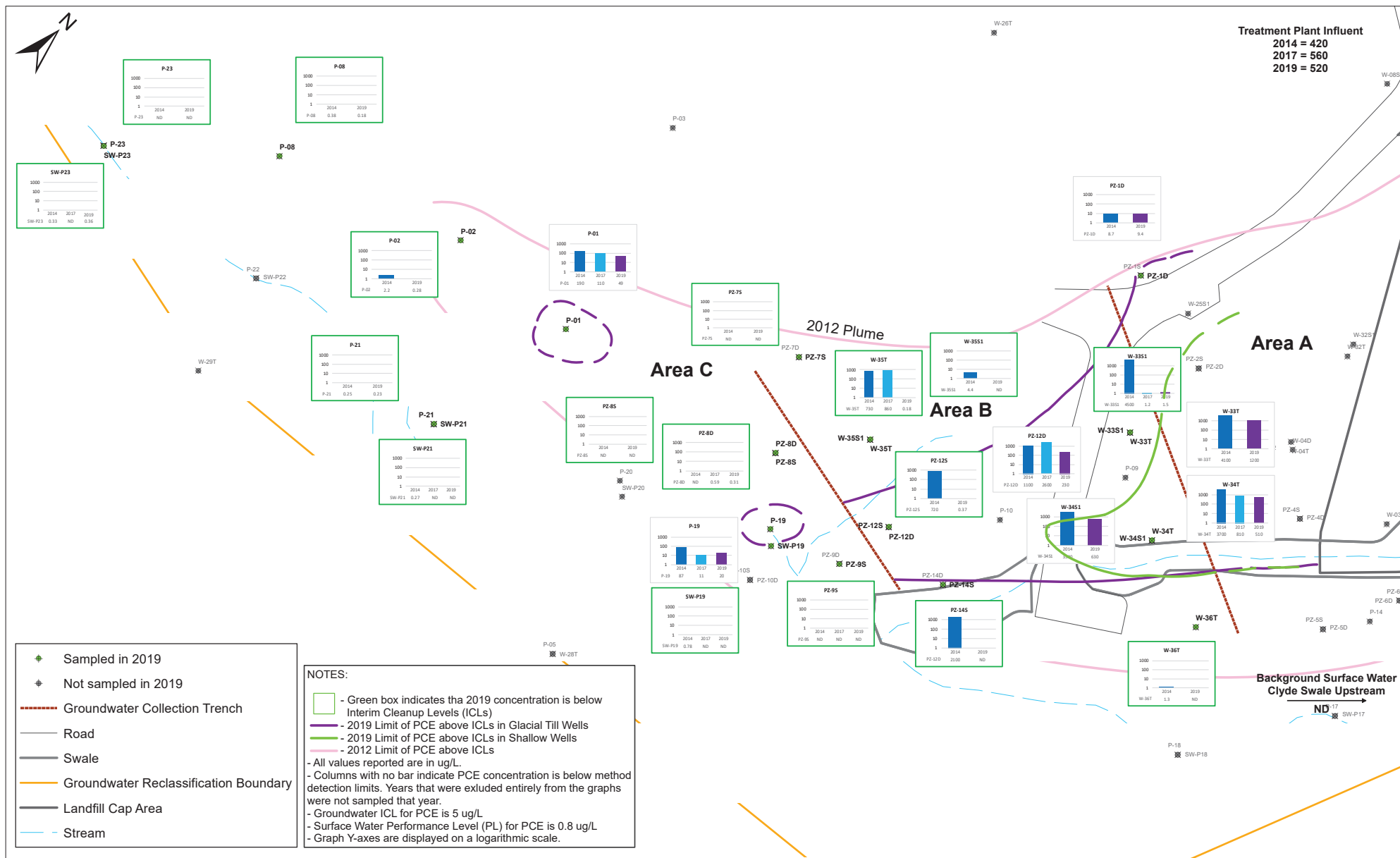
Burgess Brothers Landfill
Superfund Site
Bennington & Woodford, Vermont

Scale 1 : 1,450



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





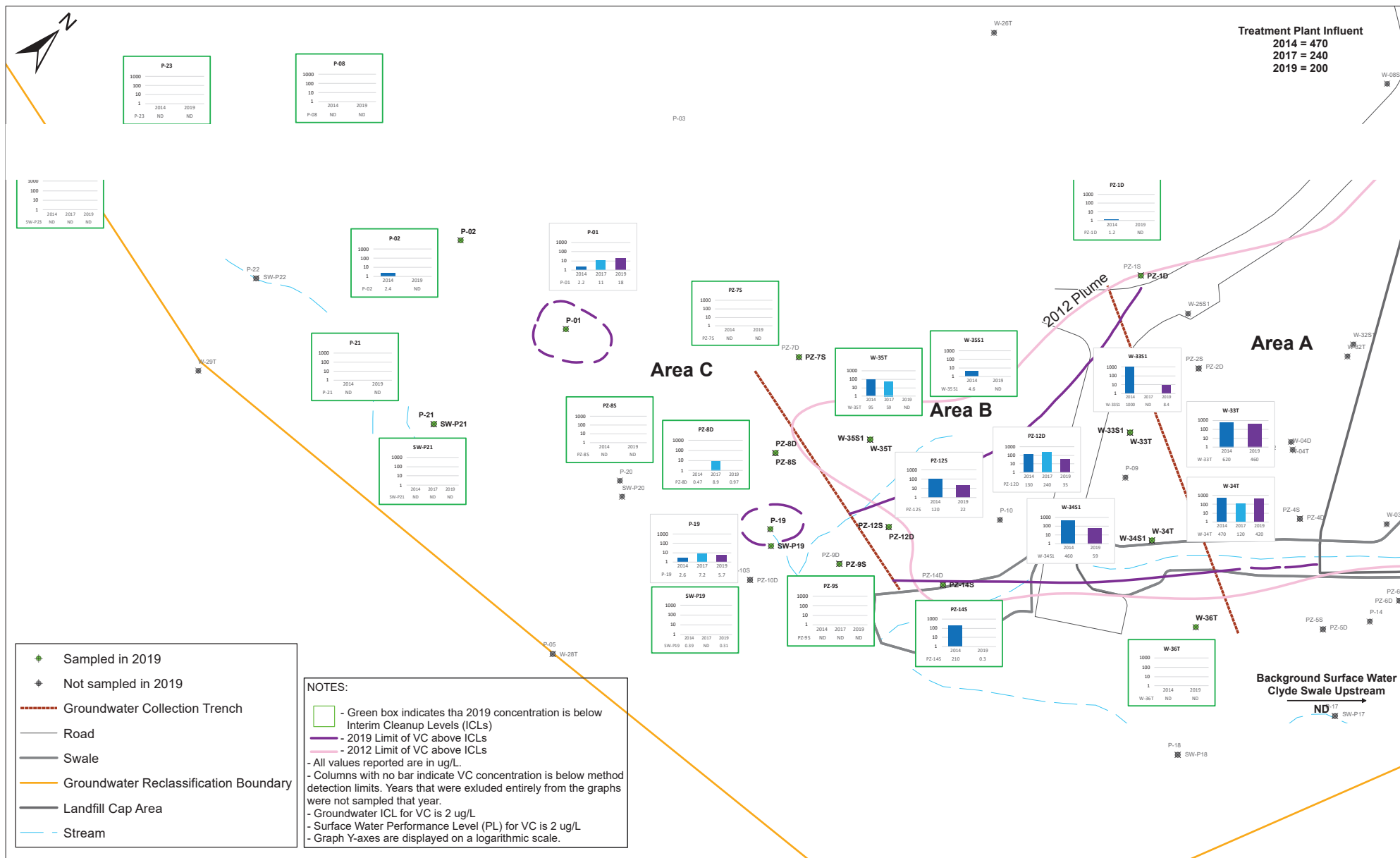


Figure 5: Vinyl Chloride Concentrations in Groundwater and Surface Water
Burgess Brothers Superfund Site
Bennington, VT
March 2020

TABLES

Table 4
Groundwater Performance VOC Data
Long-Term Monitoring Plan
Burgess Brothers Landfill NPL Site
Bennington and Woodford, VT

Area B - Between Collector Trenches											
Volatile Organic Compounds (GC/MS)											
Well ID	Analyte	Benzene	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloroethene, Total	trans-1,2- Dichloroethene	cis-1,2- Dichloroethene	Methylene Chloride	Tetrachloroethene	Trichloroethene	Vinyl chloride
	Units	µg/L									
	ICL	5	7	5	70	100	70	5	5	5	2
PZ-1D	10/04/12	-	1.8	-	52	-	52	-	13	80	5
	10/21/14	-	1.3 J	-	35	-	35	-	8.7	73	1.2 J
	09/19/19	-	-	-	2.8	-	2.8	-	9.4	26	-
W-33S1	10/21/14	-	-	-	14,000	120 J	14,000	-	4,500	6,100	1,000
	09/13/17	-	-	-	3	-	3	-	1.2	1.3	-
	09/19/19	-	0.45 J	-	26	-	26	-	1.5	1.3	8.4
W-33T	10/21/14	-	23 J	13 J	3,900	-	3,900	-	4,100	1,800	620
	09/19/19	-	34 J	-	3,600	-	3,600	-	1,200	1,100	460
W-34S1	10/21/14	-	17 J	-	2,400	-	2,400	-	3,300	1,600	460
	09/19/19	-	6.7	-	700	-	700	-	630	520	59
W-34T	10/22/14	-	19 J	-	2,500	-	2,500	-	3,700	1,700	470
	09/13/17	-	-	-	770	-	770	-	810	560	120
W-36T	09/19/19	-	15	-	1,500	-	1,500	-	510	630	420
	10/22/14	-	-	-	0.65 J	-	0.65 J	-	1.3	0.72 J	-
PZ-7S	09/18/19	-	-	-	-	-	-	-	-	-	-
	08/08/12	-	-	-	3.9	-	3.9	-	9.8	9.5	-
	10/22/14	-	-	-	-	-	-	-	-	-	-
W-35S1	09/17/19	-	-	-	-	-	-	-	-	-	-
	10/22/14	-	-	-	26	0.83 J	25	-	4.4	4.8	4.6
	09/17/19	-	-	-	0.91 J	-	0.91	-	-	0.1	-
W-35T	10/22/14	-	8 J	-	400	-	400	-	730	650	95
	09/13/17	-	-	-	440	-	440	-	860	570	59
	09/18/19	-	-	-	1	-	1	-	0.18	0.23	-
PZ-12S	08/31/12	-	-	-	240	-	240	-	850	780	42
	10/22/14	-	-	-	660	-	660	-	720	580	120
	09/18/19	-	0.24	-	0.48	0.48	-	-	0.37	3	22
PZ-12D	08/28/12	-	0.8 J	-	53	-	53	-	180	190	9.2
	10/22/14	-	7.7 J	-	510	-	510	-	1,100	820	130
	09/13/17	-	-	-	1,400	-	1,400	90 JB	2,600	1,000	240
PZ-14S	09/18/19	-	2 J	1.1 J	240	1.2 J	240	-	230	120	35
	08/30/12	-	3.7 J	-	610	4.7 J	610	-	590	330	22
	10/22/14	-	17 J	-	3,600	25 J	3,600	-	2,100	1,200	210
	09/18/19	-	-	-	0.66 J	-	0.66 J	-	-	0.21 J	0.3 J

Notes:

ICL = Interim Cleanup Level as referenced in the 2012 Statement of Work.

Highlighted **BOLD** value indicates concentration exceeds ICL

- = Not detected above the Method Reporting Limit

J = Detected above instrument detection limit, but below method reporting limit, value is estimated.

B = Compound was found in the blank and sample.

Table 4
Groundwater Performance VOC Data
Long-Term Monitoring Plan
Burgess Brothers Landfill NPL Site
Bennington and Woodford, VT

Area C - Downgradient of Collector Trenches											
Volatile Organic Compounds (GC/MS)											
Well ID	Analyte	Benzene	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloroethene, Total	trans-1,2- Dichloroethene	cis-1,2- Dichloroethene	Methylene Chloride	Tetrachloroethene	Trichloroethene	Vinyl chloride
	Units	µg/L									
	ICL	5	7	5	70	100	70	5	5	5	2
PZ-8S	10/22/14	-	-	1	0.78 J	0.41 J	0.37 J	-	-	-	-
	09/18/19	-	-	-	-	-	0.24 J	-	-	0.12 J	-
PZ-8D	10/22/14	-	-	1.4	3.3	1.2	2.1	-	-	0.79 J	0.47 J
	09/14/17	-	-	0.85 J	11	0.65 J	10	-	0.59 J	0.82 J	8.9
PZ-9S	09/18/19	-	-	-	-	-	0.2 J	-	0.31 J	0.42 J	0.97 J
	08/09/12	-	-	-	60	0.39 J	60	-	48	42	0.33 J
PZ-9S	10/22/14	-	-	-	0.58 J	-	0.58 J	-	-	-	-
	09/12/17	-	-	-	1.1 J	-	1.1 J	-	-	-	-
P-01	09/18/19	-	-	-	-	-	-	-	-	-	-
	09/12/12	-	-	-	22	-	22	-	130	130	-
P-01	10/23/14	-	1.7 J	-	96	-	96	-	190	190	2.2 J
	09/14/17	-	1.9 J	-	150	-	150	-	110	130	11
P-02	09/17/19	-	1.2 J	-	140	0.98 J	140	-	49	62	18
	09/12/12	-	-	-	-	-	-	-	8.8	7.5	-
P-08	10/23/14	-	0.2 J	-	47	-	47	-	2.2	2.1	2.4
	09/16/19	-	-	-	2.2	-	2.2	-	0.28	1.1	-
P-19	09/12/12	-	-	-	-	-	-	-	-	-	-
	10/23/14	-	-	-	-	-	-	-	0.38 J	-	-
P-19	09/16/19	-	-	-	-	-	-	-	0.18 J	0.12 J	-
	09/13/12	-	0.84 J	-	45	-	45	1.1 JB	98	120	1.4 J
P-21	10/23/14	-	1.1 J	-	63	-	63	-	87	96	2.6
	09/14/17	-	-	-	140	-	140	-	11	33	7.2
P-23	09/19/19	-	1.1 J	0.62 J	120	0.49	120	-	20	38	5.7
	09/12/12	-	-	-	0.39 J	-	0.39 J	-	11.2	1.4	-
P-21	10/23/14	-	-	-	1.3 J	-	1.3 J	-	0.25 J	0.34 J	-
	09/20/19	-	-	-	1.1	-	1.1	-	0.23 J	0.4 J	-
P-23	10/23/14	-	-	-	0.65 J	-	0.65 J	-	-	0.21 J	-
	09/19/19	-	-	-	-	-	0.22 J	-	-	-	-

Notes:

ICL = Interim Cleanup Level as referenced in the 2012 Statement of Work.

Highlighted **BOLD** value indicates concentration exceeds ICL

- = Not detected above the Method Reporting Limit

J = Detected above instrument detection limit, but below method reporting limit, value is estimated.

B = Compound was found in the blank and sample.

Table 5
Historical Groundwater Metals Data
 Long-Term Monitoring Plan
Burgess Brothers Landfill NPL Site
Bennington and Woodford, VT

Areas A, B and C					
Metals (ICP-MS)					
Well ID	Analyte	Arsenic	Lead	Manganese	Thallium
	Units	µg/L			
	PL	10	15	300	2
	CRDL	10	3	15	10
PZ-6S	08/02/12	NS	NS	856	NS
PZ-6D	08/07/12	NS	NS	129	NS
W-03	08/08/12	NS	NS	2,190	NS
W-04T	08/07/12	1.7 J	-	9,080	-
W-04D	08/07/12	NS	NS	1,600	NS
PZ-4S	08/02/12	-	-	1,300	-
PZ-4D	08/01/12	-	-	1,290	-
PZ-5S	08/06/12	NS	NS	242	NS
PZ-5D	08/02/12	NS	NS	590	NS
W-25S1	08/08/12	NS	NS	1,350	NS
PZ-2S	08/07/12	NS	NS	7,420	NS
PZ-2D	08/06/12	NS	NS	120	NS
PZ-1D	09/19/19	-	-	-	-
W-33S1	09/19/19	1.5 J	-	1,820	-
W-33T	09/19/19	-	-	84.2	-
W-34S1	09/19/19	-	-	33.8	-
W-34T	09/19/19	0.83 J	-	292	-
W-36T	09/18/19	-	-	-	-
PZ-7S	08/08/12	NS	NS	980 F	NS
	09/17/19	1.4 J	-	9,780	-
W-35S1	09/17/19	-	-	1,430	-
W-35T	09/18/19	1.3 J	-	3,620	-
PZ-12S	09/18/19	1.3 J	-	1,070	-
PZ-12D	09/18/19	0.75 J	-	295.0	-
PZ-14S	09/18/19	0.83 J	-	2,620	-
PZ-8S	09/18/19	-	-	22.7	-
PZ-8D	09/18/19	2.2 J	-	80.9	-
PZ-9S	08/09/12	NS	NS	427 F	NS
	09/18/19	4.4 J	-	5,330	-
P-01	12/14/99	-	-	17.7	-
	09/17/19	1.4 J	0.71 J	568	1
P-02	09/16/19	-	-	980	0.66 J
P-08	09/16/19	-	-	-	0.95 J
P-19	08/06/12	1.8 J	0.63 JB	NS	0.18 JB
	09/19/19	1.2 J	0.47 J	168	-
P-21	09/20/19	-	-	6.0	-
P-23	09/19/19	-	-	170	-

Notes:

PL = Performance Level for Surface Water as referenced in the 2012 State

CRDL = Contract-Required Detection Limit

Highlighted **BOLD** value indicates concentration exceeds PL

- = Not detected above the Method Reporting Limit

Q = Laboratory Qualifier

J = Detected above instrument detection limit, but below method reporting

B = Compound detected above the IDL but below the CRDL.

F = Filtered results

NS = Not Sampled (only sampled for MNA parameters)

Table 6
Groundwater Performance VOC Data Trends
 Long-Term Monitoring Plan
Burgess Brothers Landfill NPL Site
Bennington and Woodford, VT

Area B - Between Collector Trenches						Area C - Downgradient of Collector Trenches									
Volatile Organic Compounds (GC/MS)															
Well ID	Analyte	PCE		TCE	VC	Well ID	Analyte	PCE		TCE	VC				
	Units	µg/L					Units	µg/L							
	ICL	5		5	2		ICL	5		5	2				
PZ-1D	10/04/12	13		80	5	PZ-8S	10/22/14	-	↔	-	↔				
	10/21/14	8.7	↔	73	↓		1.2 J	↓	0.12 J	↔	-	↔			
	09/19/19	9.4		26	-	PZ-8D	10/22/14	-		0.79 J		0.47 J	↔		
W-33S1	10/21/14	4,500		6,100	1,000		09/14/17	0.59 J	↔	0.82 J	↔	8.90	↔		
	09/13/17	1.2	↓	1.3	↓		-	↔	0.42 J		0.97 J				
	09/19/19	1.5		1.3	8.4	↔	PZ-9S	08/09/12	48		42		0.33 J		
W-33T	10/21/14	4,100	↓	1,800	620	↓		10/22/14	-		-	↓	-	↓	
	09/19/19	1,200		1,100	460	↓		09/12/17	-		-		-		
W-34S1	10/21/14	3,300	↓	1,600	460	↓	09/18/19	-		-		-			
	09/19/19	630		520	59	↓	P-01	09/12/12	130		130		-		
W-34T	10/22/14	3,700		1,700	470	↔		10/23/14	190		190	↔	2.2 J	↔	
	09/13/17	810	↓	560	↔	120		↔	09/14/17	110		130		11	↔
	09/19/19	510		630	420	↔		09/17/19	49		62		18		
W-36T	10/22/14	1.3	↓	0.72 J	-	↔	P-02	09/12/12	8.8		7.5	↓	-	↔	
	09/18/19	-		-	-	↔		10/23/14	2.2	↓	2.1	↓	2.4	↔	
PZ-7S	08/08/12	9.8		9.5	-	↔		09/16/19	0.28		1.1		-		
	10/22/14	-	↔	-	↔	-	↔	09/12/12	-		-		-	↔	
	09/17/19	-		-	-	↔	10/23/14	0.38 J	↔	-	↔	-	↔		
W-35S1	10/22/14	4.4	↓	4.8	4.6	↓	P-08	09/16/19	0.18 J		0.12 J		-		
	09/17/19	-		0.1	-	↓		09/13/12	98		120		1.4 J		
W-35T	10/22/14	730		650	95	↓	P-19	10/23/14	87	↔	96	↔	3	↔	
	09/13/17	860	↓	570	↓	59		↓	09/14/17	11		33		7	
	09/18/19	0.18		0.23	-	↓		09/19/19	20		38		6		
PZ-12S	08/31/12	850		780	42	↔		P-21	09/12/12	11.2		1.4		-	
	10/22/14	720	↓	580	↓	120	↔		10/23/14	0.25 J	↓	0.34 J	↔	-	↔
	09/18/19	0.37		3	22	↔	09/20/19		0.23 J		0.4 J		-		
PZ-12D	08/28/12	180		190	9	↔	P-23	10/23/14	-	↔	0.21 J	↔	-	↔	
	10/22/14	1,100	↔	820	↔	130		↔	09/19/19	-		-		-	↔
	09/13/17	2,600		1,000	240	↔									
	09/18/19	230		120	35										
PZ-14S	08/30/12	590		330	22	↔									
	10/22/14	2,100	↔	1,200	↔	210							↔		
	09/18/19	-		0.21 J	0.3 J	↔									

Notes:

ICL = Interim Cleanup Level as referenced in the 2012 Statement of Work.

Highlighted **BOLD** value indicates concentration exceeds ICL

- = Not detected above the Method Reporting Limit

J = Detected above instrument detection limit, but below method reporting limit, value is estimated.

B = Compound was found in the blank and sample.

↑ = Increasing Trend

↔ = No Trend or Stable

↓ = Decreasing Trend

TABLE 7

SUMMARY OF PERFLUORINATED COMPOUNDS ANALYSIS
GROUNDWATER, SURFACE WATER, INFLUENT AND EFFLUENT WATER SAMPLES
BURGESS BROTHERS LANDFILL
BENNINGTON/WOODFORD, VERMONT
23 MARCH 2016

SAMPLE NUMBER		D33723	D33724	D33729	D33730	D33731	D33727	D33725	D33726
LOCATION		GW-P-01	GW-P-100	GW-P-02	GW-P-08	GW-W-30T	RB-01	TB-01	FTB-01
LABORATORY NUMBER		3419153	3419154	3419160	3419163	3419164	3419158	3419156	3419157
COMPOUND	MDL								
Perfluorobutanesulfonic acid (PFBS)	9	9 U	9 U	9 U	9 U	9 U	9 U	9 U	9 U
Perfluoroheptanoic acid (PFHpA)	1	5.8	4.9	3.2	1 U	1 U	1 U	1 U	1 U
Perfluorohexanesulfonic acid (PFHxS)	3	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Perfluorononanoic acid (PFNA)	2	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Perfluorooctane sulfonate (PFOS)	4	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Perfluorooctanoic acid (PFOA)	2	64	58	45	4.7	3.2	2 U	2 U	2 U
DILUTION FACTOR		0.99	0.98	0.99	0.99	0.98	1.0	0.95	1.0
DATE SAMPLED		3/23/2016	3/23/2016	3/23/2016	3/23/2016	3/23/2016	3/23/2016	3/23/2016	3/23/2016
DATE EXTRACTED		3/29/2016	3/29/2016	3/29/2016	3/29/2016	3/29/2016	3/29/2016	3/29/2016	3/29/2016
DATE ANALYZED		3/30/2016	3/30/2016	3/30/2016	3/30/2016	3/30/2016	3/31/2016	3/30/2016	3/31/2016

NOTES:

- 1) U = Values not detected above the Method Detection Limit (MDL).
- 2) Results are reported in nanograms per Liter (ng/L).
- 3) Sample GW-P-100 is a field duplicate of GW-P-01.
- 4) Values bolded and shaded in yellow were detected above the MDL.
- 5) RB-01 is the field rinsate blank.
- 6) TB-01 is the laboratory trip blank.
- 7) FTB-01 is the field trip blank.
- 8) = Sample result exceeds the 2019 Vermont Groundwater Enforcement Standard of 20 ng/L for the sum of compounds PFOA, PFOS, PFNA, PFHpA, and PFHxS.

This table was produced by Weston Solutions, Inc. as part of the Superfund Technical Assessment and Response Team START) contract to U.S. EPA Region 1.

TABLE 7

SUMMARY OF PERFLUORINATED COMPOUNDS ANALYSIS
GROUNDWATER, SURFACE WATER, INFLUENT AND EFFLUENT WATER SAMPLES
BURGESS BROTHERS LANDFILL
BENNINGTON/WOODFORD, VERMONT
23 MARCH 2016

SAMPLE NUMBER	D33815	D33818	D33816	D33817	D33820	D33819	D33821	D33822
LOCATION	SP-101	SP-1101	SP-102	SP-304	SW-P17	SW-P23	TB-02	FTB-02
LABORATORY NUMBER	3438276	3438279	3438277	3438278	3438281	3438280	3438284	3438285
SAMPLE TYPE	Influent	Influent	Influent	Effluent	Surface Water	Surface Water	Lab Trip Blank	Field Trip Blank
COMPOUND	MDL							
Perfluorobutanesulfonic acid (PFBS)	9	9 U	9 U	9 U	9 U	9 U	9 U	9 U
Perfluoroheptanoic acid (PFHpA)	1	3.7	3.5	4.4	1 U	1 U	1 U	1 U
Perfluorohexanesulfonic acid (PFHxS)	3	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Perfluorononanoic acid (PFNA)	2	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Perfluorooctane sulfonate (PFOS)	4	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Perfluorooctanoic acid (PFOA)	2	55	55	48	2 U	3.5	4.8	2 U
DILUTION FACTOR	0.93	0.92	0.92	0.93	0.92	0.91	0.91	0.92
DATE SAMPLED	4/26/2016	4/26/2016	4/26/2016	4/26/2016	4/26/2016	4/26/2016	4/15/2016	4/26/2016
DATE EXTRACTED	5/6/2016	5/6/2016	5/6/2016	5/6/2016	5/6/2016	5/6/2016	5/6/2016	5/6/2016
DATE ANALYZED	5/7/2016	5/7/2016	5/7/2016	5/7/2016	5/8/2016	5/7/2016	5/8/2016	5/8/2016

NOTES:

- 1) U = Values not detected above the Method Detection Limit (MDL).
- 2) Results are reported in nanograms per Liter (ng/L).
- 3) Sample SP-1101 is a field duplicate of SP-101.
- 4) Values bolded and shaded in yellow were detected above the MDL.
- 5) TB-02 is the laboratory trip blank.
- 6) FTB-02 is the field trip blank.
- 7) = Sample result exceeds the 2019 Vermont Groundwater Enforcement Standard of 20 ng/L for the sum of compounds PFOA, PFOS, PFNA, PFHpA, and PFHxS.

This table was produced by Weston Solutions, Inc. as part of the Superfund Technical Assessment and Response Team (START) contract to U.S. EPA Region 1.

Table 8
Historical Surface Water Data
Long-Term Monitoring Plan
Burgess Brothers Landfill NPL Site
Bennington and Woodford, VT

Volatile Organic Compounds (GC/MS)						Metals (ICP-MS)														Total Cyanide
Sample ID	Analyte	1,2-Dichloroethene, Total	Tetrachloroethene	Trichloroethene	Vinyl chloride	Aluminum	Antimony	Arsenic	Colbalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Zinc	Cyanide
	Units										µg/L									
	PL	-	0.8	2.7	2	87	14	0.018	10	8	1,000	1.5	4,100	0.012	108	5	1.2	1.7	58.9	5.2
	CRDL	-	-	-	-	200	60	10	50	25	100	3	15	0.2	40	5	10	10	20	10
SW-P19	08/16/11	NS	NS	NS	NS	55.7 J	-	-	-	-	285	-	178	-	-	-	-	-	-	1.2 J
	09/12/12	-	3.7	3.1	-	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/23/14	-	0.78 J	1.1	0.39 J	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	09/14/17	-	-	-	-	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	09/17/19	-	-	0.34 J	0.31 J	-	-	-	1.2	-	2,320	0.51	1750	-	1.8	1.1	-	0.83	-	-
SW-P21	12/15/99	NS	NS	NS	NS	38.8 B	-	-	-	-	108	-	38.9	-	-	-	-	-	2.9 B	-
	04/18/01	NS	NS	NS	NS	139 B	-	-	-	-	121	-	29.6	-	-	-	-	-	-	-
	05/13/02	NS	NS	NS	NS	59.7 B	-	3.3 B	-	-	125	-	45.5	-	-	-	-	-	1.8 B	-
	05/13/02	NS	NS	NS	NS	74.3 B	-	-	-	-	132	-	50	-	-	-	-	-	4 B	-
	05/21/03	NS	NS	NS	NS	37.9 B	-	-	-	-	92.8 B	-	33.7 E	-	-	-	-	-	-	-
	05/21/03	NS	NS	NS	NS	40.5 B	4.6 B	-	-	-	112	-	40.5 E	-	-	-	-	-	-	-
	04/05/04	NS	NS	NS	NS	132 B	-	-	-	0.7 B	132	-	21.9	-	-	-	-	-	3.7 B	-
	04/05/04	NS	NS	NS	NS	81.3 B	-	-	-	-	47.6 B	-	20.5	-	-	-	-	-	3.5 B	-
	06/08/05	NS	NS	NS	NS	92.4 B	-	-	-	3.2 B	160	2.4 B	44.5	-	-	-	-	-	-	-
	06/08/05	NS	NS	NS	NS	65.5 B	-	-	-	-	119	-	36.9	-	-	-	-	-	-	-
	05/18/06	NS	NS	NS	NS	90.8	-	-	-	1.9 J	145	-	45.2	-	-	-	-	-	6.8 J	-
	08/16/11	NS	NS	NS	NS	109 J	-	-	-	-	324	-	137	-	-	-	-	-	-	-
	09/12/12	-	2.4	2.1	-	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/23/14	-	0.27 J	0.54 J	-	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	09/14/17	2.2	-	-	-	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	09/17/19	1.9	-	0.11 J	-	61.9	-	-	0.62 J	-	1,260	0.74 J	642	-	3.1	1.2 J	-	1.1 J	-	-
SW-P23	09/22/92	NS	NS	NS	NS	170 J	23.4 J	-	-	-	367	-	61.8	-	-	-	2.2 J	-	-	-
	04/13/93	NS	NS	NS	NS	222	-	-	-	3.6 J	268	-	50.8	-	-	-	-	-	-	-
	04/13/93	NS	NS	NS	NS	218	-	-	-	5.2	269	-	44.1	-	-	-	-	-	-	-
	11/16/93	NS	NS	NS	NS	50 J	-	-	-	-	94 J	-	20	-	-	-	5.1 J	-	-	-
	11/16/93	NS	NS	NS	NS	-	14 J	-	-	-	30 J	-	-	-	-	-	5.8 J	-	-	-
	11/21/94	NS	NS	NS	NS	283	-	-	-	-	598	-	156	-	8.2 J	-	-	-	-	-
	11/21/94	NS	NS	NS	NS	134 J	-	-	-	-	209	-	48	-	6.4 J	-	-	-	-	-
	06/01/95	NS	NS	NS	NS	42.8 B	-	-	-	-	-	-	25	-	-	-	-	-	-	-
	11/13/95	NS	NS	NS	NS	124 B	-	-	-	-	178	-	50.5	-	-	-	-	-	3.9 B	-
	05/15/96	NS	NS	NS	NS	101 B	-	-	-	-	190	-	35	-	-	-	-	-	-	-
	05/15/96	NS	NS	NS	NS	93.2 B	-	-	-	-	164	-	34.8	-	-	-	-	-	-	-
	05/01/97	NS	NS	NS	NS	83.3 B	-	-	-	-	159	-	29.1	-	-	-	-	4.5 B	2 B	-
	12/15/99	NS	NS	NS	NS	28.3 B	-	-	-	-	86 B	-	31.8	-	-	-	-	2.9 B	3.2 B	-
	04/18/01	NS	NS	NS	NS	156 B	-	-	-	-	144	-	31.4	-	-	-	-	-	-	-
	05/13/02	NS	NS	NS	NS	28.4 B	-	3.2 B	-	-	47.3 B	-	20.1	-	-	-	-	3.7 B	2.7 B	-
	05/21/03	NS	NS	NS	NS	25.5 B	3.4 B	-	-	1.1 B	92.8 B	-	31.7 E	-	-	-	1.6 B	-	-	-
	04/05/04	NS	NS	NS	NS	97.4 B	-	-	-	0.87 B	81.8 B	-	20.4	-	-	-	-	-	5.2 B	-
	06/08/05	NS	NS	NS	NS	54.1 B	-	-	-	-	97 B	-	25.1	-	-	-	-	-	-	-
	05/18/06	NS	NS	NS	NS	185 J	-	-	-	3 J	236	-	33.6	-	-	-	3.1 J	-	9.8 J	-
	05/05/09	-	0.9 J	0.66 J	-	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	08/16/11	NS	NS	NS	NS	122 J	-	-	-	-	315	-	64.2	-	-	-	-	-	-	-
	10/23/14	-	0.33 J	0.55 J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	09/14/17	-	-	-	-	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	09/17/19	-	0.36 J	-	-	201	-	-	0.36 J	-	895	0.67 J	380	-	2.2	-	-	0.36 J	-	-
SW-CS	09/17/19	-	-	-	-	176	-	-	0.60 J	-	818	1.1	278	-	-	-	-	0.23 J	-	-

Notes:

PL = Performance Level for Surface Water as referenced in the 2012 Statement of Work.

CRDL = Contract-Required Detection Limit

Highlighted **BOLD** value indicates concentration exceeds PL

- = Not detected above the Method Reporting Limit

J = Detected above instrument detection limit, but below method reporting limit, value is estimated.

B = Compound was detected above the IDL but below the CRDL

Table 9
Historical Sediment Data
 Long-Term Monitoring Plan
Burgess Brothers Landfill NPL Site
Bennington and Woodford, VT

<i>Metals (ICP-MS)</i>											
Sample ID	Analyte	Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Zinc
	Units	mg/L							mg/kg	mg/L	
	PL	6	0.6	26	16	20,000	31	460	0.2	16	120
	CRDL	10	3	10	5	100	3	15	0.2	40	20
SED-08	4/15/93	5.1 B	1.7 B	15.5	17.3 B	24,900	71.4	1,340	0.6	16.4 B	227
	4/19/01	2.1 B	0.14 B	4.7	6.1 B	7,840	16.6	276	-	3.8 B	31.8
	5/13/02	1.1 B	0.24 B	5.8	5.1 B	7,310	14.8	246	-	6.4 B	27.3
	5/21/03	0.9 B	0.56 B	4.0	3.9 B	2,940	11.1	168	0.028 B	4.7 B	24.6
	4/05/04	1.4 B	0.17 B	6.3	6.4 B	9,330	18.3	339	-	5.1 B	38.8
	6/08/05	2.2 B	0.19 B	4.6	4.4 B	7,980	13.2	278	-	3.6 B	28.2
	5/18/06	1.9	0.53 J	6.1	17.4	11,900	19.7	459	0.03 J	4.7 J	38.8
SED-14	12/15/99	2.7 B	-	5.6	6.7 B	13,000	10.8	375	-	12.2	38.5
	4/19/01	1.7 B	0.15 B	4.2	4.7 B	7,300	11.4	240	-	7.4 B	26
	4/19/01	2.3 B	0.3 B	5.1	7.5	7,100	11.4	240	0.059 B	6.1 B	24.2
	5/21/03	1.4 B	0.15 B	3.4	-	3,990	12.5	70	0.1	22.2	46.1
	4/05/04	2.3 B	-	4.2	4.1 B	8,090	7.5	145	-	5.5 B	19.5
	6/08/05	1.6 B	0.11 B	3.6	3.5 B	6,090	9.4	270	-	7 B	25.5
	5/18/06	1.1	0.16 J	3.2	7	5,400	6.9	184	-	4.6	17.8
	10/03/19	1.6	0.16 J	4.5	3.3	8,720	7.4	990#^	0.1	6.5	28
SED-CS	9/17/19	2	0.131 J	3.8	4.6	12,000	8.5	150^	0.1	5.2	24.5

Notes:

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- = Not detected above the Method Reporting Limit

J = Detected above instrument detection limit, but below method reporting limit, value is estimated.

B - Compound was detected above the IDL but below the CRDL

^ = Instrument related QC is outside acceptable limits

= MS/MSD RPD exceeds control limits